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1919

REPORT OF
AGRICULTURAL COMMISSION
TO EUROPE



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Report of AGRICULTURAL COMMISSION to Europe

Observations Made by American
Agriculturists in Great Britain,
France, and Italy for the United
States Department of Agriculture

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WASHINGTON, D. C., JANUARY 17, 1919

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REPORT OF AGRICULTURAL COMMISSION TO EUROPE.

OUTSTANDING FACTS.

IT IS DIFFICULT to summarize the reports of the Agricultural Commission to Europe because they contain so many facts that in order to comprehend the whole situation one must read the reports in detail. Moreover, the observations were made prior to the armistice, which was signed on November 11, and the purpose of the visit was to ascertain conditions of European agriculture as they related to the agriculture of the United States under a continuance of the war. The Commission arrived in Liverpool on September 5, and, returning, sailed from Liverpool on October 29. In some respects, therefore, the reports lose interest except for their historical value, but for the most part the data, the suggestions, and the recommendations possess large economic value in appraising agricultural responsibilities in the United States for the year 1919 and for the years immediately following, and they exhibit some new angles of mutual responsibility and interest.

Some of the outstanding facts are:

Great Britain's war agriculture in 1918 increased her home-grown bread supplies fourfold.

The reports for the harvest of 1918 indicate that in the matter of breadstuffs England could supply herself forty weeks of the year as against ten weeks in 1916.—Thompson.

France's production of foods decreased sharply, especially in sugar beets, which were grown principally in the northern area, where the ravages of war were greatest.

*Prior to the war France was producing about 800,000 tons of sugar and consuming about 600,000 tons. * * * The present production of France amounts to about 250,000 tons, or possibly with favored crop it may run to 300,000 tons.—Thompson.*

France's production of breadstuffs also declined, though the production of 1918 was somewhat better than the production of 1914.

In Italy there has been some reduction of the cultivated area, but except for wheat the reduction in the volume of breadstuffs has not been very serious.

The yield per acre also has decreased, the two chief direct causes being shortage of fertilizer and uncontrolled growth of weeds.—Pearson.

Italy's wheat production in 1918 was estimated at 43,000,000 quintals (220 pounds) compared with 46,153,000 quintals in 1914.

LIVE STOCK.

Great Britain has maintained her herds of cattle and has increased her sheep and made small losses in hogs. All cattle in 1914 numbered 12,184,505, and in 1917, 12,382,236; hogs declined something more than 900,000. Horses in 1914 were 2,237,783 and in 1917 2,190,318. Complete figures for 1918 were not available, but so far as ascertained they did not indicate material variation from the figures of 1917.

Sheep were declining in Great Britain before the war for the same reasons as existed in the United States. They have increased in numbers since the beginning of the war on account of the increase in the prices of wool and meat.—Rommel.

In France all live stock has declined. The comparative figures on December 31, 1913, and on June 30, 1917, are as follows:

	1913.	1917.
Cattle.	14,787,710	12,443,304
Sheep.	16,131,390	10,586,594
Hogs.	7,035,850	4,200,280
Horses.	3,231,000	2,283,000

However, France has maintained her young cattle. Her "breeders" over one year in 1913 numbered 2,853,650, and under one year 2,112,440. The same classes in 1917 were 2,677,870 and 2,016,860. The decline in sheep is most serious, while there is a sharp decline in hogs.

Sufficient supplies of breeding stock will probably remain in any event to permit fairly rapid replacement after the war.—Rommel.

Italy's cattle have declined from 7,100,000 in 1914 to 6,155,419 in 1918, but her calves have increased from 1,600,000 in 1914 to 1,801,808 in 1918.

Many orders have been in effect for the purpose of conserving live stock. For example, in some sections calves weighing less than 440 pounds could not be slaughtered. In other sections the minimum limit was 120 pounds.—Pearson.

Similar restrictions were applied to the slaughtering of sheep and hogs. Italy's present estimated needs are 1,000,000 cows and 500,000 oxen. Sheep have slightly increased since 1908 and are now about 11,000,000, substantially the same as in 1914. Hogs have been greatly decreased.

Generally speaking, Great Britain, France, and Italy will need to import for some time to come large supplies of meats, fats, dairy prod-

ucts, and concentrates for animals. Some importations of live stock for breeding purposes may be made, but for the most part importations will consist of live-stock products. In France and Italy the preservation of young animals gives promise of comparatively early restoration of both dairy and beef herds, and the general thought of producers there is that their present basis stock is the best adapted for their purposes.

SEEDS.

At the time of the Commission's observations the seed situation for 1919 appeared to be very acute, both as to supply and effective distribution. This situation perhaps will be intensified as to supply by the demands of the devastated regions which are now released for normal activities, but distribution will perhaps be considerably improved.

Unless through prompt international action the approximate stocks and requirements of the vitally important seeds for each country can be determined as a basis for the administration of the existing export restricting regulations in force in the several countries with respect to seeds, the prospect for prompt restoration of normal production in several of the countries will be seriously impaired. The existing conditions tend to favor the forcing of seed prices to destructive high points and thus to endanger the welfare of our own farmers as well as thousands of the allied countries.—Taylor.

One of the distinctive agricultural advances made by Great Britain was the "Testing of Seeds" order, under which sellers of agricultural seeds are required to declare the purity and germination of seeds offered for sale.

The law is applicable to farmers who sell seed except that farmers may sell seeds as "grown" to merchants without having a test made, in such case merely stating the name of the variety.—Taylor.

The act met with the hearty cooperation of the British seed trade.

NEEDS.

In addition to the live-stock products already mentioned, Great Britain, France, Italy, and Belgium will need to import for some time to come large supplies of wheat, fertilizers, fibers (wool and cotton), and farm machinery. All countries under review have made marked progress in the utilization of farm machinery, especially in the use of tractors.

War practices in agriculture have interfered to a considerable degree with established methods of crop rotation and soil building. While these observations were made during active war and look forward to a continuation of war through 1919, they apply in large part to the farming operations of the spring and summer of 1919, for the reason that demobilization, the restoration of transportation, and the return to normal conditions can not be immediately effected.

REPORT OF W. O. THOMPSON, CHAIRMAN.

MY DEAR MR. SECRETARY:

In August, 1918, it was your pleasure to appoint a commission to visit Europe for the purpose primarily of studying the agricultural conditions in England, France, and Italy. The commission was constituted as follows: Mr. Carl R. Vrooman, Assistant Secretary of Agriculture, Washington; Mr. R. A. Pearson, President, The Iowa State College of Agriculture, Ames, Iowa; Mr. W. A. Taylor, Chief of the Bureau of Plant Industry, Washington; Mr. George M. Rommel, Chief of the Division of Animal Husbandry, Washington; Mr. Thomas F. Hunt, Dean of the College of Agriculture, University of California, Berkeley; Mr. David R. Coker, Cotton Grower, Hartsville, S. C.; Mr. George R. Argo, of the Bureau of Markets, Washington; and Mr. W. O. Thompson, President, Ohio State University, Columbus, Ohio. Mr. John F. Wilmeth, of the Bureau of Markets, was assigned to serve as secretary, clerk, and business manager of the commission. It is a pleasure to report that the services of Mr. Wilmeth were painstaking, accurate, and acceptable. It would be difficult for any person to satisfy the demands of such a position more exactly or acceptably than did he.

TERM OF SERVICE.

The Commission went on board ship on August 23, sailed August 24, arrived in Liverpool September 5, and proceeded that same evening to London. The time of the Commission was divided between England and France, although Mr. Pearson made a journey to Italy and Mr. Rommel made a journey into Scotland. The Commission went on board ship at Liverpool, Tuesday, October 29, left the harbor in the morning, Wednesday, October 30, arrived in New York harbor the evening of Monday, November 4, and landed Tuesday morning, November 5, returning to Washington that afternoon.

RECEPTION OF THE COMMISSION.

Upon arrival in London the Commission reported to the United States Embassy and was accorded the usual courtesies and attention. Later the Commission reported to the Honorable R. E. Prothero, Minister of Agriculture, who received us most cordially and made provision for our study of agriculture by putting at our disposal the services of his office. Through the kindness of Sir Daniel Hall, Secretary to the Minister of Agriculture, and Mr. W. E. Walters, Secretary to Sir Daniel Hall, an itinerary was prepared and, at the request of the

Board of Agriculture, the War Office provided the Commission with automobiles and drivers free of expense, so that the Commission spent approximately two weeks in visiting the rural districts of East and West England, and studied the conditions of agriculture at first hand and by interviews with farmers, land owners, stock growers, and others interested in the practices of agriculture.

In France, after calling upon the United States Embassy and M. Victor Boret, the Minister of Agriculture, we were assigned to Mr. Henry Girard, Inspector General of Agriculture, and Count Le Marois, a military officer, who served as hosts for the Commission. These gentlemen arranged at the expense of the French government for military officers, automobiles, hotel accommodations, and every possible convenience so that the Commission was able to spend practically two weeks in visiting the representative rural portions of France within reasonable distance from Paris. In addition to this, the British, French, and American military officials arranged for automobile service and guides by which the Commission was able to visit the three battle fronts and to see a large portion of the devastated areas of the invaded territories.

In addition to these official courtesies the Commission was most cordially received and welcomed by the officials of Oxford and Cambridge, England; by Director E. J. Russell of the Rothamstead Experiment Station, Harpenden, who gave the Commission a most profitable and instructive day; by the Institute of Agronomy, Paris; by the Agricultural School at Grignon; by the Academy of Agriculture, Paris, which presented the members of the Commission with a specially prepared medal for the occasion; and by the National Farmers Society of France and by numerous other officials not representing societies but engaged in agricultural service. Individual citizens of both England and France were extremely cordial in greeting the Commission and putting at its disposal any information in their possession. The Commission takes pleasure in recording its high appreciation of all these services and courtesies.

METHODS OF WORK.

After some discussion the Commission decided that as a method of procedure it would as a whole make certain tours and visits for purposes of observation, and that each individual under these circumstances would be entirely free to prepare his own comments upon the observations. It was further decided that in individual instances, men should make personal investigation of topics in which they were more or less experienced. This enabled the Commission to specialize its inquiries with certain members of the Commission and to compare

observations so as to bring the net result of substantial agreement upon all the more important observations and conclusions. Accordingly, a journey was made in automobiles by a portion of the Commission up the western counties of England and another portion on a journey up through the eastern counties. Certain shorter journeys were made within reasonable distances in automobiles from the city of London.

In France the same method of procedure followed. It was the privilege of the Commission to visit the Percheron district; the Bordeaux district, where the grape growing industry is at its maximum efficiency; the Normandy district, where we had the opportunity to see and learn of the cattle industry; and the Lannes district, where the French government has about 2,000,000 acres of land devoted to forestry. This movement was projected as early as 1785, although active development of the forests did not occur until about 1860. The chief purpose in this area was the protection of the inlands from the encroachments of the ocean. The sand dunes are in some places several hundred feet high. The French government has in this great asset ordinarily a source of resin for commercial purposes, and later a source of lumber. The government has realized, therefore, not only protection for the farm land within, but has made this strip along the ocean a source of profitable revenue for an indefinite period. At present the timber is being used as war material, with the French, Canadian, and American governments all engaged in cutting timber for such needs as the war program develops.

The visit to the three battle fronts enabled the Commission to see with some vividness the wanton destruction of this war upon the agricultural areas of Northern France. This destruction has affected the crop production; destroyed a large amount of agricultural machinery; depopulated villages and cities; taken away a large amount of industrial machinery; utterly demolished buildings; scattered the territory over with barbed-wire defenses and other obstructions that make the land and the entire area an object of great expense in order to restore it to normal uses. Prior to the war France was producing about 800,000 tons of sugar and consuming about 600,000 tons. She was able, therefore, to export practically one-fourth of her sugar production. Three-fourths of all the sugar beets in France were grown in the invaded territory. Since the war sugar beet production in the invaded areas has been reduced to practically nothing. The present production in France amounts to about 250,000 tons or possibly, with favored crop, it may run to 300,000 tons. In addition to this about eighty per cent of all the sugar factories have been utterly destroyed by the military invasion. The restoration and reconstruction, therefore, of this area presents a most serious agricultural problem.

BRITISH CONDITIONS.

War is an upsetting experience, but when the unrestricted "U-boat campaign" was announced England was more than upset. She was alarmed and at her wits' ends. No one could foresee what the result might be. The surrender of the British was expected by the enemy but could not be contemplated by the British themselves. Accordingly, a determined effort was made to increase the home production of food stuffs as a measure of safety and self-preservation. War necessity was the only consideration. The methods pursued should not be regarded therefore as necessarily based on sound economic principles. If the practices of a war emergency proved to be economically sound it was a mere accident, not the result of a deliberate choice. Necessity was the chief stimulus.

A Food Production Department with a Director General was organized. This carried into every county an Executive Committee with a complete and comprehensive organization clothed with authority to make the work effective. The chief divisions were: (1) Local organization; (2) Labor; (3) Cultivation; (4) Supplies; (5) Technical; (6) Horticulture.

Within this organization the producing forces of England were mobilized in as effective a method as war conditions would permit. The reports for the harvest of 1918 indicate that in the matter of bread-stuffs England could supply herself forty weeks of the year as against ten weeks in 1916. Under the stimulus thus organized the acreage of tillable land for wheat, barley, oats, rye, and other cereals was considerably increased, almost 2,000,000 acres. In all, the acreage was increased over 1916 by 2,142,000 acres. Of this area 217,000 acres represented the increased area planted to potatoes. The increase in wheat area was the greatest since 1882. The increased acreage for oats was the highest on record. In England and Wales there was broken up not far from 2,500,000 acres of "permanent" grass land as a war measure. Including Ireland and Scotland the total area thus plowed up was approximately four million acres.

The effect of this was twofold: (1) to increase food for home consumption; and (2) to decrease the demand for tonnage. Both of these effects were important factors in a war program.

The labor problem for this increased acreage was not easy of solution. Several factors entered into this. First, was an increase of the number of women who usually perform some of the agricultural labor and an increase of the amount of time these women gave to such labor. A second factor was the organization of the Women's Land Army.

The estimates are that 260,000 women were employed in war agriculture as against 90,000 prior to the war. The Women's Land Army

through the County Agricultural Committees provided for enrollment and training centers to the number of six hundred and twelve. Two hundred Committees of selection aided in locating members of the Women's Land Army. The employment of these women in general was in the capacity of milkmaids, stockmen, tractor drivers, ploughmen, threshing gangs, horsemen and carters, and general farm laborers. The general effect of this movement upon the future of agriculture in England can not now be forecast but the significant thing about the movement would seem to be that Women's Institutes have been organized and a certain permanence assured. At all events the woman's point of view on agricultural production will receive more attention than in the past.

A third factor in the labor problem was the plan for furloughing soldiers home for agricultural service. The record shows more than fifty-seven thousand soldiers were thus sent to the farms for longer or shorter periods. Many of these were accustomed to farm labor and made efficient farm laborers. The exigencies of the war situation, however, made this element in the solution of the labor problem less effective than was hoped.

A fourth factor was the employment of German war prisoners. There were 189 camps organized in England for these prisoners in 1917. Later this number was almost doubled. The records show that 13,706 prisoners were assigned to farmers in 1917 and that plans were matured for using twice that number. At the outset some prejudice against the use of prisoners existed, but this steadily disappeared. The testimony is that a majority of them proved to be steady and skilled laborers well content to go about their daily tasks.

The general condition of British agriculture may be described as prosperous. Prices for labor and all materials are at a high level. So also is the range of prices for live stock of all kinds. The products of the garden were reasonable in price. Potatoes followed approximately the supply and demand. In England transportation while below normal was not so much disturbed as in France. It was possible, therefore, to have a better distribution of products and more uniformity in prices.

The live stock conditions and general agricultural conditions are so amply treated in the reports of the members of the Commission that reference to these is made without further comment.

The needs of England as indicated for the future are wheat, meats, concentrated feeds, sugar and fibers. This situation has suggested to the Commission the desirability of an *after war program of production*. These would seem to be the weightiest reasons for *post bellum* cooperation. Unless the Allies can provide for some agency through which an international intelligence may guide the productive activi-

ties of the several countries, an unbalanced production may break the markets and, through the resulting dissatisfaction of the farmers, dissipate much of the good feeling developed during the war. Furthermore the intelligence developed through war experiences has put upon the nations a new moral responsibility in the matter of production. The world, by which we mean the many millions, has a right to ask that the organization of the world's forces shall be made effective in producing the necessary food supplies and in a proper distribution of them. If we can effectively and bountifully feed an army of unprecedented size, then there is some reason to believe that the world can if it will organize itself into an effective agency for feeding the world. This once determined upon, there will be abundant demand for all the products of the earth for years to come.

FRENCH CONDITIONS.

The first impression in passing through rural France suggests the lack of men of military age and the wonderfully neat and clean condition of the farms in spite of this fact. Nowhere did we see in village or country men of military age unless in uniform. Probably nine millions of men (variously estimated at eight to ten millions) have been mobilized in some manner since the war. It has been affirmed by competent witnesses that for every man thus mobilized a woman has taken his place. These women carry on the business of the farm, meeting all engagements, performing the labor, paying the bills, and doing anything else necessary to keep the farms in action as "going concerns." Without much noise or publicity the women of France have met the war situation with a devotion, an efficiency, and a heroism that should forever enshrine them in the affections of the French Nation. To their credit be it said that in 1917 when wheat prices did not change and when factory prices for woman's labor had advanced by leaps and bounds the peasant women remained with the farm and its work while their fellow women of the cities were receiving the advantage of the rapid increase in wages.

In the rural districts of France the labor of women was observed in almost every possible capacity—even to working on the maintenance and repair of the roads. The older men beyond military age were often engaged in work for which their age rendered them measurably inefficient. Despite these facts the appearance of the country and of the crops was good, although careful testimony revealed the fact that the labor shortage was felt in the reduced production. This year (1918) the beet sugar crop is probably the poorest in a generation and vegetables in general are a poor crop. Potatoes are good in certain areas, but the lack of transportation facilities has hindered the distribu-

tion throughout France. The apple crop, good in 1917, is a failure in 1918. The supply of dairy products is very limited in the cities. The loss of two million cattle since the war, including many producing cows, has reduced the total supply of milk. At present despite their shortage in totals there are as many or more yearling cattle as in 1914 and the younger milch cows are being retained. Since 1917 a glass of milk could not be purchased anywhere in the cities due to lack of transportation, the demands of the army and the country consumption. At present (October, 1918) milk may not be sold after 9 A. M. None may be sold in restaurants and hotels except a limited amount for breakfast. Milk cards are issued as a protection for children and the sick.

In general French agriculture in the areas not invaded during the war period has been influenced by the shortage of men for labor and the substitution therefor of woman-labor and of children below the normal age for agricultural work. This has affected in some measure the efficiency of farm operation, thus tending to decrease the annual output. The shortage of fertilizers and the withdrawal of horses for army purposes have contributed to the same end. The invaded areas have been practically depopulated through the destruction of the villages. The limited agricultural activities in these regions have not greatly increased the total supply for the country since most of the production was by the military organizations and often lacked the continuity in cultivation and careful attention so essential to successful crop growing. The immediate restoration of this invaded area to normal production is obviously impossible. The second year after the war should show great progress toward the normal conditions provided the processes of restoring the land are promptly set in motion. This calls for the reconstruction of the villages, a supply of farm machinery, the necessary factories in sugar beet growing areas and the general reclamation of shell-torn areas for farm operations. This preliminary preparation for agricultural operations, if left to private initiative, may be long delayed. It would seem to be a most urgent public enterprise in which the allied governments should cooperate as the final stage of the war activities. To leave such an undertaking to the governments of France and Belgium will put upon them an economic handicap for which no money indemnity could adequately compensate.

The outstanding shortages in France may be mentioned in the following order, although there is room for a difference of opinion as to the exact order basing opinion upon comparative necessity. These needs are: wheat, meat, concentrated feeds, sugar, fertilizers, farm machinery and dairy products. The fact that France in 1918 had substantially as many yearling cattle as in 1914 will make it possible

to return to the pre-war production within two or three years provided she is able to import a sufficient supply of meat meantime. The close of the war should make possible in a short time such a reorganization of shipping facilities as would promptly readjust the market for fertilizers and concentrated feeds. This would at once react favorably upon all other agricultural needs.

The opinion of the Commission may be expressed as favoring such continued cooperation among the allied governments as will provide for urgent needs arising out of war conditions. This cooperation should not be left to private initiative but should be with such official recognition as to insure an adequate program free from the evils of exploitation. The effect of the war upon agricultural production in France will abide for a period of two or three years at least. It would appear, therefore, that cooperation in recovery is an important opportunity not to be neglected if the best fruits of the war are to be preserved.

OTHER COUNTRIES.

In the time at its disposal the Commission was not able to visit Scotland, Ireland and Italy, as was anticipated.

Mr. Rommel, however, was able to make a brief journey into Scotland. His report deals with conditions there so far as the limited time available permitted him to make observations.

Mr. Pearson spent a few days in Italy and has submitted a report on his observations. Reference to this report, which is presented as a part of the Commission's report, will disclose an interesting situation in Italy. The story of the effect of the war upon agricultural operations and conditions is much the same in all the invaded areas. Where countries have been invaded the destruction and often the obliteration of farm buildings, machinery, live stock and villages make the problems of agriculture primarily those of reconstruction, refurnishing and rehabilitation.

CONCLUSION.

In submitting this report it is proper to state that the Chairman of the Committee is responsible for the general summary. The members of the Commission are responsible for the individual reports presented herewith as part of the report of the Commission. The suggestions and recommendations presented were discussed at length, and agreed to by the Commission. These are presented separately in order that they may stand out as the opinion and judgment of the Commission and not be confused with the individual opinions or judgments of members of the Commission as expressed in their reports. No effort was

made to harmonize in detail either the expression of opinions or judgments by members of the Commission. Statements of fact based upon statistical evidence, official reports or personal testimony may not always agree in detail owing to the time at which the information was secured. These minor details, however, do not influence the general conclusions to be drawn concerning British and French agriculture as set out in these reports. The theory upon which the Commission proceeded gave full freedom to each member to present the results of his observations and investigations in a personal report. Frequent conferences and discussions determined the general character of the work of the Commission as well as of the reports submitted.

On behalf of the Commission, the Chairman is privileged to express the appreciation of all the members of the honor conferred upon them and the confidence reposed in them by the appointment to this service. So far as is known this is the first and only war commission charged with the single duty of investigating the conditions of agricultural production. The aim was, if possible, to discover what could be done to make it absolutely safe that so far as food supplies were involved the war would be won. Further, the outlook for agriculture after the war was a subject of thought and discussion. The Commission submits its report in the hope that the way has been opened for further cooperation with our transatlantic neighbors in the future.

With renewed expression of thanks and appreciation of the Commission, this report of its service is respectfully submitted.

Very truly,

W. O. THOMPSON,
Chairman.

Hon. DAVID F. HOUSTON,
Secretary of Agriculture.

REPORT OF R. A. PEARSON.

THE CONDITION OF AGRICULTURE IN GREAT BRITAIN, FRANCE, AND ITALY, AND PLANS FOR RECONSTRUCTION AFTER THE WAR, AND THEIR EFFECT ON AMERICAN AGRICULTURE.

Like all other interests in the countries of the Allies, agriculture has had to make its heavy contribution to the war. This has been chiefly in men, but also in larger taxes, in sacrifice of many horses and food animals, in higher costs for labor and supplies, and in countless more or less serious inconveniences due to army needs, interrupted transportation, lack of fertilizer, and sometimes losses on account of fixed prices and regulations regarding the sale of products. In devastated districts the sacrifice has been to the utmost except the lives of those who could escape and the small amount of personal property they could take away and except the land itself, which is now in a more or less serious condition depending upon how much it has been subjected to shell fire and bombs and to what extent it was made ready for military operations by trenches and barbed wire.

Each Government has furnished relief and help to agriculture through the guarantee of stimulative prices on certain products, through loans, direct assistance with tractors and plows at less than cost, and through labor from military sources. In the devastated regions of Northern France money is being given to the returned farmers to help them rebuild, restock, and to renew their farm operations.

In each of the allied countries the subjects of rehabilitation and readjustment in the field of agriculture are receiving attention. But definite, comprehensive plans are not yet announced. It is natural that each nation would desire to make its own plans, and it is obvious that they are the best qualified to do so, as our nation would assert for itself if conditions should obtain here as there. It is generally agreed that several years will pass, after peace is assured, until normal conditions are restored. Some authorities think this will require from five to seven years; one mentions the possibility of ten years.

In Great Britain the production of wheat has been greatly increased, and at the sacrifice of many fine pastures. The fertilizer situation is serious, but not nearly so bad as it would have been without the fertilizer by-products from manufacturing and munition making. Aside from the labor shortage, the greatest difficulty now encountered by farmers in Great Britain is the shortage of concentrated feeding stuffs, which is expected to materially cut down the home-grown meat

supply next spring. But in spite of this the best breeding stock of all kinds is being kept up in good condition and the supply of market milk is being maintained nearly to the quantity needed. There is a decrease in meat production, especially in pork. English farmers expect to sell stock in war-devastated areas as soon as conditions permit. The need of more good cheese in English markets was emphasized. Wheat and meat, of course, will continue to be needed in large amounts.

Generally speaking, the farmers of the United Kingdom have done well both as to speeding up production and as to profits. There is an active movement in the sale of land to tenant farmers and at good prices.

In Great Britain an extended report on Agricultural Policies, with recommendations, has been issued from a subcommittee of the Ministry of Reconstruction. Many agricultural leaders and experts gave evidence in 1916 and 1917. A summary of this has been published. Then there followed the committee's report, published this year. The committee was instructed to report especially upon methods to secure an increase of home-grown food supplies. They carefully reviewed the agricultural situation, including a study of pre-war conditions. The recommendations cover a wide range of subjects related to agriculture. But future policies are not yet decided. One of the big questions very often referred to is whether the Government will take steps to continue some form of encouragement to wheat growing to make this crop reasonably remunerative so that larger yields can and will be maintained as a national protective measure. Other food crops and farm animals are included more or less in these discussions. With the services of horses in this war in mind one easily sees the importance of measures to improve horse breeding. As a war measure a minimum wage has been established for farm laborers, and their hours of work are regulated. Some think it is very doubtful as to whether these measures will be given up after the war. If they are continued, they, of course, would be used as an argument in favor of governmental action to furnish some protection to farmers against loss in food production. Making it possible for returned soldiers to secure small farms and homes on easy terms, and better homes for farm laborers are questions upon which considerable progress already has been made. Small farms already are awaiting purchase by discharged soldiers, who are receiving practical agricultural training, and small homes are being erected.

France has suffered severely in her agriculture. Her great wheat yield has been heavily reduced. There has been a reduction in the number of cattle, but the number of calves shows an increase over pre-war figures. The land needs fertilizer and the live stock is in need of

concentrates. Beet-sugar production has been an important industry in Northern France, and it suffered the fate of all other industries in the devastated area. France now needs to continue for an indefinite time her imports of wheat and meat. She also needs fertilizers and, especially for the devastated area, she needs a large quantity of farm machinery, building material, and stock.

Many farmers in the main portion of France, which did not suffer from invasion, have prospered under war conditions. Many others have not. All farmers seem to have done their best to keep up the production. In the devastated area, which comprises a strip of land where the fighting has been most active, destruction is complete. It is hard to imagine how it could be worse. The farmers' villages are in ruins. Frequently not one structure remains intact. In some cases hardly a wall remains in sight. The land is cut by trenches with numerous dugouts. There are many barbed-wire entanglements. Also there are very many shell holes from three to about twenty feet in diameter, with occasionally a larger one. The people all were driven out. They could take but little of their property. All that was left behind was carried off or destroyed. But only a small percentage of France has been injured so seriously.

In Italy the greatest agricultural need at this time is fertilizers, especially phosphates. The lack of imports during these few years has had a cumulative effect which is becoming serious. The situation is further aggravated by the fields becoming foul with weeds, due to shortage of labor. These conditions will seriously affect production for at least a year or two and probably considerably longer. The invasion of a large area in Northern Italy resulted in the almost complete disappearance of the fine cattle of that section. The number of cattle in the country has been greatly reduced also by the increased meat requirements, which led to the slaughter of many animals. The maintenance of large imports of frozen meat is wanted, so that young live stock may be spared to be matured, and normal conditions as to animals for work, meat, and milk may be restored as soon as possible. The shortage of agricultural machinery also is serious on account of reduced imports.

What can the United States or farmers in this country do to help?

Our first and immediate opportunity lies in food production. Secondly, we will be asked for seeds, farm machinery, stock feeds, fertilizers, cotton, wool, and other supplies that farmers need. It is not to be expected that we will be asked to send to Europe large numbers of breeding animals, because our breeds are not known and favored to any great extent in the districts needing restocking. But doubtless our breeders will feel the effects of stock movements into the empty

areas. Some animals, including poultry, will be wanted there, or in other places from which shipments are made.

The question now of utmost importance to us relates to the quantities of food from this country that will be wanted in Europe during the next few years. Large demands will be made on us for a time, but no one can tell how much will be wanted, even for the next year. It will depend upon:

- (1) What the different countries can do for themselves.
- (2) What amounts will be available in other exporting countries.
- (3) What shipping facilities will be available.

These important factors in turn depend upon others which are in doubt and include the military situation, the restoration of normal agricultural processes, the weather as it affects crops, and ship building.

Wheat production in Russia is an item of great importance and doubt. In the average of the years 1911 to 1913 the Russian Empire wheat crop exceeded the crop in any other country, being 727,133,300 bushels, with the United States second, at 704,995,000 bushels. Furthermore, the Russian Empire produced 935,010,300 bushels of rye, the next largest production of rye being in Germany, with less than half as much. No one knows what Russia will do in food production, but all know that what she has been producing is an item of enormous importance. It is a serious question, also, as to how rapidly France, Italy, and Austria-Hungary can resume normal or near-normal production.

The meat and fats situation also is abnormal, and this kind of production requires considerable time for readjustment even when all conditions are favorable.

American farmers have speeded up their efforts in order to have a surplus for export to the Allies during the war. Reasonably accurate information as to what quantities of foods were wanted for export these last two years has been available, and our farmers have been advised by the United States Department of Agriculture and the State Colleges as to how much they should increase production. They should not now be left to make their own estimates as to the future. If they have needed advice the last two years they will need it still more the next two years.

This leads to the recommendation that foreign governments be invited to inform our Government as to the principal food supplies they will wish to find here. The information should come sufficiently early to be of use in making food production plans. Furthermore, it should be accompanied by a satisfactory guarantee, from each Government concerned, as to price. With such information and such a guarantee the question of taking steps to produce a surplus becomes a plain busi-

ness proposition. This arrangement would place the risk on the people to be benefited. If it is left with the producers, they are likely to act on the safe side and gradually or rapidly return to the usual acreages and numbers of stock.

Great advantages to this and other nations should come from international discussions of food-production plans during a period of a few years after the war. A special body might well be constituted for this purpose, and it should have the benefit of assistance of the International Institute of Agriculture at Rome.

It is recommended, also, that some representatives of our Government, who are familiar with our agricultural conditions, shall be designated to participate in international councils, giving special attention to the rehabilitation of farms and to other agricultural questions. Such persons also, for a time, should be available in Europe for consultation with representatives of other Governments who will need to look to this country for help, in the form of seeds and other supplies. The need of agricultural information from the United States frequently is urgent. Very large interests are concerned. And the settlement of questions should not depend upon persons who are not informed, nor upon those who happen to be abroad to represent private interests, although some gentlemen in this latter class undoubtedly have rendered valuable service.

THE AGRICULTURAL SITUATION IN ITALY, AS AFFECTED BY THE WAR.

The following information was secured chiefly from officials of the Italian Department of Agriculture in Rome, October 5-7, 1918.

IN GENERAL.

Agricultural operations in Italy have been carried forward against very great difficulties. Relief is being furnished through the importation of wheat and frozen meat and through the use of prisoners of war and other prisoners. Government officials placed great emphasis upon the need of fertilizers, especially phosphates. They also emphasized the desirability of continuing the importation of frozen meat and even on an increased scale, so that the largest possible number of young live stock may be retained and matured for breeding purposes and as dairy and work animals. At the present time Italy is said to be short about one million cows and half a million oxen.

It is not necessary here to dwell upon the changed conditions in Italy outside of agriculture, but we should not overlook the fact that some of these conditions are very serious and that they have an important influence upon agricultural operations. For example, owing

to the shortage of coal, various industries have suffered, but particularly transportation has been affected. At times there has been coal only for the main railroad lines. This has interfered with the shipment of the food supplies. Also, it has interfered with the shipment of articles needed by farmers. Owing to transportation difficulties, due to coal shortage and other causes, it is said that considerable perishable produce has spoiled during shipment.

It is said that in sections where mixed farming prevails—that is, where perhaps milk, fruit, grain, and vegetables are produced—the farmers are doing well from the standpoint of profits—even better than before the war. But in the more exclusive grain districts the farmers are not so prosperous. One of the great sacrifices made by farmers was the plowing up of permanent, irrigated pastures for the purpose of utilizing this ground with its nitrogen reserves for growing grain. It means much to destroy one of these old pastures, the surface of which has been so carefully formed to care for irrigation waters. Generally, the farmers broke up this land willingly when requested or directed to do so. Sometimes they protested, but as a rule they were satisfied to sacrifice their grass lands when the need for this was explained to them.

CROPS.

During the last few years there has been some reduction of cultivated area, especially in Southern Italy, where the agricultural population lives chiefly in towns. But except for wheat the reduction has not been very serious. The area in wheat was about normal up to and including the 1916 harvest, when 4,726,300 hectares were reported. Since then there has been a decrease of about 500,000 hectares. The yield per acre also has decreased, the two chief direct causes being shortage of fertilizer and uncontrolled growth of weeds. The latter, of course, means a shortage of labor. Women and boys used to give a great deal of help in controlling weeds, but now they must do more important and heavier work elsewhere. Owing to unusually good climatic conditions, the yield of wheat in 1918 is favorable, especially as compared with the preceding year.

Wheat Production.

Year.	Quintals (220 lbs.).	Quintals per hectare.	Year.	Quintals (220 lbs.).	Quintals per hectare.
1909	51,813,000	10.9	1914	46,153,000	9.7
1910	41,750,000	8.8	1915	46,414,000	9.2
1911	52,362,000	11.0	1916	48,044,000	10.2
1912	45,102,000	9.5	1917	38,102,000	8.9
1913	58,452,000	12.3	1918	1 43,000,000

¹ Estimated.

In normal times Italy imports 12 to 15 million quintals annually. Last year the importations amounted to about 32 millions of quintals. This year the quantity of wheat needed through imports probably will amount to as much as 25 million quintals.

The Italians depend greatly on their bread supply. A simple calculation on the basis of 38 million inhabitants shows a liberal quantity of wheat per capita. At times during the war, some districts have suffered for wheat. Early in 1916 at one time the supply of flour in Rome was reduced to a quantity sufficient only for about three days. In some small towns in 1917 no flour was available for a period as long as ten days. In one industrial center where there was no bread for one day there were riots. By way of emphasizing the serious cumulative effect of lack of fertilizer, it was stated that if this situation continues the wheat yield by 1920 or 1921 may be reduced to 50 per cent of the normal yield. Elsewhere it is mentioned that some difficulty has been found in getting farmers to plant wheat, because already their yield per hectare has fallen so low as to make the crop unpromising. To stimulate wheat growing the Government takes the crop and now pays 60 lire (franc) per quintal, with an addition of 15 per cent, making a total of about 69 lire for hard wheat produced in southern Italy. Next year the Government will raise the rate from 60 to 75 lire in its effort to have the acreage maintained. This higher rate is equivalent to \$4.09 per bushel, assuming rate of exchange to be normal.

The Government incurs a heavy loss in the sale of wheat in order to hold down the price of bread. It is sold to local committees for bakers for 46 lire per quintal.

The maximum prices of cereals as announced by the Government represent what the farmer receives. The Government pays for cartage from the farm. The maximum prices announced in Ministry decrees for the crops of 1917, 1918, and 1919 are as follows, in lire per quintal:

Maximum Prices Announced in Ministry Decrees.

Cereal.	1917	1918		1919	
		For Italy.	Additional for southern Italy and certain islands.	For Italy.	Additional for southern Italy and certain islands.
Soft and semi-hard wheats..	45	60	7.50	75	11.25
Hard wheats.....	50	70	9.00	85	12.75
Corn.....	33	45	5.50	56	8.40
Oats.....	33	45	5.50	56	8.40
Barley.....	40	50	6.00	62	9.30
Rye.....	40	50	6.00	62	9.30

The par value of one lire, according to the United States Director of the Mint, is 19.3 cents; the exchange value of one lire on July 1, 1918, was 11.2 cents and on October 1, 1918, 15.75 cents.

Through the Ministry of Supplies the Government buys all wheat, corn, barley, and rye. Through the Ministry of War it buys all of the oats and certain beans which are eaten by the people. Through the Ministry of Agriculture the Government buys seed potatoes. The entire potato crop is not taken because of its perishable nature. An official effort was made to limit the price of potatoes, but this was not a success, because the farmers considered the price too low and they were unwilling to sell, and some of them even did not dig their crop. The interference with potato prices there was discontinued, except that the Government intervenes if prices become too high at any point.

The changes of prices of the principal crops is shown in the following table:

Average Annual Prices.

Products.	In lire (about 20 cents) per quintal (220 lbs.).				
	1912	1913	1914	1915	1916
Soft wheat.....	30.71	28.68	28.75	40.43	38.49
Hard wheat.....	34.11	32.48	33.50	44.67	42.69
Corn.....	21.92	18.16	18.10	29.47	28.80
Rice.....	38.01	41.28	36.56	39.50	42.53
Rye.....			21.67	33.63	35.31
Barley.....			21.10	26.84	28.55
Oats.....	25.43	22.48	21.92	30.07	30.35
Beans.....			24.53	29.24	30.97
French beans.....			31.17	41.54	53.03
Potatoes.....	10.63	10.64	10.21	13.84	14.96
Hemp.....			96.04	127.25	206.13
Hay.....	8.95	8.46	9.48	9.38	12.20
Common wine.....	36.23	30.08	23.12	35.56	78.11
Olive oil.....	148.20	146.90	151.61	167.50	204.28

Active efforts are being made to encourage the production of malt-ing barley, and the Government is giving particular attention to the selection of varieties of rice as well as wheat and other crops which are best adapted to different sections of the country.

Thanks to the ability of the Italian farmers to cooperate, as has been shown through their successful cooperative agricultural organizations, excellent work is being done along the lines of seed improvement and with active Government help. In each province there is a special commissioner of seeds. He has power to seize and distribute any seed needed. This power is given to assure the distribution of seeds into sections where they will give the best returns and at fair prices. The work is done as far as possible through private seed concerns. Their business is regulated, but it is not taken away from them as long as they are considered to be dealing fairly. It is said that private trade is respected and efforts are made to encourage it. If the Government

regulations are not complied with, the business is taken over by officials. Wheat seed may not be sold until it is declared fit by the commissioner. This is a war measure and is looked upon as highly important. Before seed can be sold it must be properly cleaned and graded. If seedsmen do not have necessary machines for this, the Government gives help to secure the machinery. The authorities have requisitioned some of the best seed-growing areas in their plans to assure sufficient seed of good quality. Also, the Government arranges to take superior seed from farmers who might use it otherwise and gives them in exchange grain of smaller seed value but of equal value for other purposes. A bonus of a few lire per quintal, perhaps as high as 5 lire, also is allowed, and even a still larger bonus for seed of good quality or high value. The net result of all these efforts is said to be that the farmers are now getting better seed than they got before the war.

LIVE STOCK.

Information on this subject was furnished at the Ministry of Agriculture, chiefly by Dr. Vittorino Vezzani, Director of the Zootechnic Institute of Monte di Mezzo.

There was no census of cattle in Italy before the war, but according to a close estimate the number of cattle and calves in 1908 was about 6,200,000. It is believed that this number had increased by at least 15 per cent in 1914. A census taken this year showed about 6,150,000 bovine animals, or about the same number as in 1908. These figures indicate comparatively little change since 1908, but the fact is there has been a large change as the normal relation between young stock and old stock has been altered. There is now a relatively large amount of young stock, with a heavy decrease in numbers of cows and oxen. Thus:

Cattle in Italy, 1914 and 1918.

Kind.	1914 (estimated).	1918 census.
Calves	1,600,000	1,801,803
Bulls and bull calves.....	140,000	171,544
Cows and heifers.....	3,900,000	3,053,194
Oxen.....	1,460,000	1,128,873
Total.....	7,100,000	6,155,419

Many orders have been in effect for the purpose of conserving live stock. For example, in some sections calves weighing less than 440 pounds could not be slaughtered. In other sections the minimum limit was 120 pounds; and there were rules against the slaughter of heifers or pregnant cows. The number of sheep that could be slaughtered and their age were regulated. No lamb weighing less than 17.2 pounds

could be killed. Pigs weighing less than about 150 pounds could not be killed. It was unlawful to slaughter mares or asses that might be used for breeding purposes. Farmers protested against some of these rulings, and revisions were made in an effort to have them more acceptable.

Italy now is said to need 1,000,000 cows and 500,000 oxen. Practical difficulties in the way of supplying this stock even after the war include transportation, but more particularly the fact that just the kind of live stock wanted is not freely available. It is pointed out that with only a little more than 6,000,000 cattle, including young stock, to about 38,000,000 people, the reduction in number of animals is a serious matter for Italy.

The reduction in number of live stock is due to the loss of large numbers of animals to the enemy in invaded sections and to the necessity of slaughtering stock to furnish meat needed by the soldiers and civilian war workers. In the provinces lost temporarily in the war there were about 400,000 cattle, and these were taken by the enemy. This was especially serious because it almost cleaned out an important strain of cattle in Italy. They were derived from Swiss stock, apparently the Simmenthal, and were considered superior because they grow faster and have lighter skeletons and therefore less waste than the usual Italian cattle, which have been developed largely with the view to their working qualities. Fortunately, it has been the custom annually to send some thousand head of young stock from northern Italy to Tuscany to be fattened for the city markets. These were saved from the invasion and now are being held under direction of the Government for breeding purposes. The Austrians also helped themselves to a very large quantity of preserved meat in tins, which had to be replaced by the slaughter of more animals. The rate of slaughter also was increased because of the greater requirements of meat for the Army. Soldiers needed more meat than the same men required when outside of the Army. The speeding up of industries also increased the demand for meat, and many Italian people who had previously used but little meat came into the market for it. The difficulties were further increased by the shortage of shipping accommodations and the impossibility of getting as much frozen beef as was wanted. Much of this came from Argentina. The importation of frozen meat by the Ministry of War amounted to 291,794 quintals in 1915. The amount increased to 909,894 quintals in 1916 and to 1,006,995 quintals in 1917. The total of these importations for three years was equivalent to more than 1,000,000 cattle of an average weight of about 900 pounds. The number of animals slaughtered in Italy during the three years of war was about 7,000,000 instead of slightly over 5,000,000, which would have been normal.

With the war the supply of concentrated feeding stuffs fell off. A larger per cent of wheat was made into flour, which reduced the quantity of bran. Little oil seed was available in Italy, and importations of seed and cake were interrupted. The oil seed was so scarce that prices of oil became exceedingly high. There was such a serious shortage of hay in some districts, largely due to requisitioning the supply for the Army, that farmers had to gather leaves and branches to feed their cattle. It is said that some farmers had to depend upon the leaves of elms, mulberries, poplars, and vines; also upon the residue from making wines. In Sicily the cactus was used.

The meat supplies for the civil population had to be reduced about 50 per cent in 1917, and recently the reduced supplies have been cut in two, so that now the meat supplies for civilians are about one-quarter normal. Rationing with meat tickets has not been resorted to because there is such a wide difference as to the use of meat. Some persons use none and tickets issued to them would easily become objects of sale and the purpose of rationing would be defeated. The average amount of meat available per person in Rome is only about 200 grams per month. A limited amount of meat is allowed to the butcher shops, and long lines of people await their turn whenever there is prospect of making purchase. The meat is allowed only on three days of each week—Thursday, Saturday, and Sunday.

Normally, the price of animals on the hoof varies from 80 to 100 lire per quintal (220 pounds). The Government requisition price in October, 1918, was 300 lire for calves and 330 lire for grown animals. When animals are sold privately for working or milking purposes the prices may run up to 1,000 lire per quintal for grown animals and the prices of calves up to 700 lire per quintal. The normal butcher-shop prices for meat with 25 per cent bone is 3 to 3½ lire per kilogram (2.2 pounds). The price in October was 8 lire. The meat business is controlled by the Government.

A three-year program has been worked out in connection with the meat situation. It is proposed to continue the present curtailment in the use of meat for three years after the war. It is desired, also, to increase the importation of frozen meats from 20,000 tons each month, which they do not now always succeed in getting, to 28,000 tons for the Army. It is hoped that importations can be continued in such quantity and for such length of time as may be necessary after the war to save desirable young stock for breeding.

Among special measures taken to prevent speculation, prefects of provinces were authorized to forbid the movement of work animals from their provinces. The enforcement of such a regulation naturally would be difficult, and it is not known how efficient attention was given to this work.

The Italian Government takes great interest in stock breeding. The Ministry of War cooperates in and encourages the breeding of horses and mules. There are stud farms. The Ministry of Agriculture gives similar attention to other breeds of animals. The Ministry of the Interior has charge of veterinary work.

Poultry is very expensive. It is scarce because grains can not be used as feed. In many cities it used to be forbidden to keep poultry, but now the people are encouraged to utilize their kitchen waste in this way.

Rabbits constitute an important food item. They have been greatly decreased on account of the reduction of clover and alfalfa, which have been turned over to the Army, but near the cities there has been some increase of rabbits with the use of food discarded from the markets.

DAIRYING.

Much of the best dairy work in Italy was carried on in the northern districts, which were invaded. Besides the loss of dairy herds, a large number of well-equipped dairy factories were wrecked. There is, of course, a shortage of market milk, acute at times. Milk prices have been changed frequently, the effort being made to keep them high enough to serve as a suitable stimulus to production. Before the war in Northern Italy farmers received 15 centimes per liter for milk, and in cities it was sold for 30 centimes. In Southern Italy the prices were about 25 and 35 centimes, respectively. In October, 1918, in Northern and Central Italy consumers were buying milk for 80 centimes per liter, in Rome at 90 centimes, and in Northern Italy at 1 lire per liter. The sale of milk is usually organized and conducted by communes, although considerable quantities are handled by private dealers.

Only a little butter is being produced. Considerable cheese is made, but it is all requisitioned for the Army. In some districts the cheese output is as high as 70 per cent of the normal.

It is thought that some arrangement will be made for the Government to assist farmers in Northern Italy to buy dairy cows and thus restore their herds as promptly as possible after they can return to their land. If the use of tractors continues after the war, there will be less demand for work cattle and more demand for animals that will economically produce meat and milk. As to whether strictly dairy breeds would be wanted in Italy, there is considerable doubt. A few years ago representatives of one of the best dairy breeds were tried, but they were not popular. It was said they were hard to acclimatize and they would not fatten up well. Besides this, of course, they had the objection of not being good work animals for those who clung to the old ideas. It was pointed out that probably the United States

could not help Italy much by sending dairy cattle, but they could give great help by furnishing frozen meat, which would assist Italy to mature her own young stock. Canned meat has not been popular, but might be substituted to a certain extent.

SHEEP.

Sheep have increased in number slightly since 1908. There are now about 11,000,000 head, or the same as in 1914. One explanation for this is the reduction of land devoted to grain, thus furnishing more uncultivated area where sheep may be pastured. Also, there is a heavy demand for wool, and but little is imported. Besides this, cheese made from sheep's milk is an important food.

HOGS.

The number of hogs has greatly decreased. They have been fed according to three different systems: First, on small farms, where they were given the refuse and but little grain; such feeding continues, but there are few animals. Second, some swine have been fed on corn; this has had to be stopped because all of the corn was needed for human food. Third, considerable numbers of hogs were fed on whey; there are less of these now, because less cheese is being made.

HORSES.

There is a reduction in the number of horses, due to the heavy Army demands. Many have been imported from America. The shortage will be relieved very quickly and in large measure as soon as demobilization begins.

MEASURES TO INCREASE PRODUCTION.

When it first became evident that measures would need to be taken to stimulate food production in Italy, an extensive campaign was started by the Government, and this has been actively continued to the present time. Also, plans have been made which will extend two or three years in the future. The Government efforts related chiefly to wheat, corn, potatoes, oats, barley, rye, beans, vegetables, and live stock; in some regions also sugar beets. The work is carried on under the authority of the Minister of Agriculture, Senor Giambattista Miliani, and under the immediate direction of Professor Antonio Marozzi, Director of the Office of Rural Organization. The Department of Agriculture devotes itself to questions of production. A separate Ministry of Foods gives special attention to distribution and prices.

The Department of Agriculture was made responsible for the maintenance of production of food and was given power by law, if necessary, to compel farmers to increase their acreage of certain crops. As a rule, the farmers gave fine cooperation. Each province and subdivision of province was carefully studied as to its normal area and production, the rotations in operation and the possibilities of increases. Orders for increasing production applied to areas or zones having fairly uniform agricultural conditions. These orders gave the percentage of the area of each farm that must be devoted to certain specific crops. For example, in one of the lower Venetian provinces the division of land might have been required as follows: In wheat, 55 per cent; in maize, potatoes, or beets, 15 per cent; in hemp or other "industrial products," 10 per cent; in pasture, 20 per cent.

In another section having much live stock, more land would be allowed for pasture, and perhaps only 40 per cent would be required to grow wheat. In computing the percentage of area to be devoted to different crops, certain areas were excluded, such as vegetable gardens, orchards, vineyards, tracts of mulberry trees for silk worms, woods, stone-paved yards, court yards, and roads.

The law provided a fine of about \$50 per acre for any person who failed to apportion and cultivate his land as directed. Also, the Government could seize such land, including machinery, animals, and seeds, and turn this entire equipment over to others designated by the Government and who would follow instructions. Occasionally a farm was taken in this manner. This occurred in numerous cases in the vicinity of Rome, where the high prices of wool, cheese, and milk were a temptation to the farmers to keep the land in grass in spite of orders to the contrary. When the Government took a parcel of land it paid a minimum rental. In these matters the Government is assisted in each province by an agricultural committee or section having an agricultural officer known as a commissioner. These commissioners receive salary from the Government. In each of the smaller divisions of the province, known as communes, there are voluntary cooperating commissioners. The agricultural committee is made up of two or three farm operators, the same number of farm workmen, one military man, and an agricultural expert. Usually this last is the director of the traveling schools of agriculture in the province. The law requires the agricultural institutional representatives and their staffs and agricultural associations to cooperate. Each committee is in close touch with the situation in its district, and is assisted by some Government traveling representatives and other traveling men, who report conditions as they are observed in different places. It was emphasized that the agricultural commissioners are either expert agricultural advisers or successful farm operators, and never politicians.

At the headquarters office in Rome the work is divided under four chief heads, as follows: (1) Technical, (2) Legal, (3) Labor, (4) Mechanical Plowing. The Labor Office gives special attention to the distribution of emergency farm labor. Italian soldiers are made available for short periods. Prisoners of war are utilized. The office has power, also, to compel civilians to work on farms, but this power has not been exercised. The Mechanical Plowing section gives attention chiefly to the introduction and use of tractors for plowing. The machines are owned by the Government and are operated by soldiers. There are about one thousand power machines now in use by the Government, in addition to about one thousand which are owned privately. Two thousand more outfits are being built, and orders have been placed for two or three thousand in addition. Only a few of these machines are made in Italy. About three-fourths of them are American. It is preferred to import machines because of the limited supply of iron, coal, and labor in Italy.

The Government operation of tractors is done at about one-half of cost, but there seems to be no other way to furnish the necessary power and to overcome the labor shortage. It is expected that after the war the machines will be taken by larger farmers and by cooperative organizations on a basis of 20 per cent reduction for the former and 40 per cent reduction for the latter.

Some agricultural machinery is made in Italy, but they depend largely upon importations. About one-third of the supply used to come from Germany. The total of these imports has been severely reduced. Thus the need for machinery has been accumulating in recent years, and now is very great, as is indicated by the following table:

Importations of Agricultural Machinery.

Year.	Mowers and harvesters.		Other machines.		Total.	
	Quantity in quintals.	Value in lire.	Quantity in quintals.	Value in lire.	Quantity in quintals.	Value in lire.
1910.....	54,125	6,495,000	116,104	15,093,520	170,229	21,588,520
1911.....	63,183	7,581,960	123,355	15,419,375	186,538	23,001,335
1912.....	64,586	7,756,320	126,671	15,883,875	191,257	23,583,707
1913.....	52,461	6,295,320	101,458	12,174,960	153,919	18,470,280
1914.....	56,912	6,109,440	87,652	10,510,240	138,564	16,627,680
1915.....	39,212	4,705,440	41,670	5,000,400	80,882	9,705,840
1916.....	37,674	5,462,730	6,342	919,590	44,416	6,382,320

For the purpose of encouraging production the Government has established a moratorium on land rentals. Also, farmers may be permitted to remain on the land after their rent period expires if in the judgment of a special committee this is in the interest of food production.

Farmers are required to loan machinery to neighbors who are in need of this help to save their crops. This requirement, however, is not rigidly enforced.

Rural credits are provided. The Government gives credit on crop security. If the crop fails, the security is placed on the next crop. Eventually the State assumes the risk if necessary. About seven million dollars have been advanced for this purpose through the Bank of Naples. This is only a small part of the funds thus advanced. The farmers pay legal interest, at first about 5 per cent, now 6 per cent, and this covers all expenses to the farmer. Rural credits have been known a long time in Italy, but the system has been strengthened and broadened on account of the war.

The Government gives prizes for breaking up new ground. These amount to an addition of about 10 per cent to the price allowed on the product. These prizes are given also when it is shown that crops have been raised under exceptionally difficult conditions, and recently it has been recognized that the conditions are exceptionally difficult in most of Southern Italy and Sicily, besides smaller areas elsewhere. So that throughout these considerable parts of Italy all the farmers enjoy the prize allowances.

FERTILIZERS.

The fertilizer situation is causing much anxiety. Great dependence is placed upon imported fertilizers. The quantities of imports in recent years are shown in the following table. The increase of nitrates evidently is due to munition requirements, and do not result in material benefit in crop production.

Annual Importations of Fertilizers.

Quintals (220 pounds).

Kinds.	1912	1913	1914	1915	1916
I.					
Mineral Phosphates..	4,661,440	5,297,760	5,139,980	4,569,010	4,814,250
Perphosphates.....	370,320	722,280	582,490	137,650	20,400
Basic Slag.....	1,181,900	1,192,570	232,240	11,800	27,160
II.					
K Cl.....	81,529	70,606	62,899	15,687	9,211
K ₂ SO ₄	134,660	94,539	37,083	8,998
III.					
Crude Na NO ₃	546,339	674,176	598,498	727,298	856,493
(NH ₄) ₂ SO ₄	211,902	216,689	131,100	76,010	28,237

It is said that only about 16 per cent of the normal amount of phosphates is now available. The phosphate question was referred to as the most serious agricultural question in Italy for the next few years. On considerable areas it has been the custom to secure nitrogen through

alfalfa and to accumulate phosphate through its application each year for about three years. Then the land was plowed and planted to wheat without phosphate. The lack of this fertilizer during a short period of years is likely to have a serious effect for a prolonged period. In fact, farmers in the valley of the Po are now objecting to sowing grain because they can not secure fertilizer. The Government, however, is requiring the planting, although it is quite evident that many farmers will suffer losses on account of a decreased yield. It was stated by an agricultural official that if one ship could be provided to carry phosphates from Africa to Italy, this would be as great a help as would come from fifteen ships bringing grain from across the Atlantic to Italy.

The potash question is not so serious. Some substitutes have been found for the usual forms of potash. These substitutes include olive oil residues and some local mineral deposits. Nitrates are made in Italy from water power, but the quantity available for agriculture is reduced to about one-third the normal amount because of munitions requirements. The situation is made still more difficult because shipments of ammonium sulphate are not now coming from England.

FARM LABOR.

The agricultural labor situation is very serious because of military service, which has fallen heavily upon Italian farms as upon other industries. Wages for labor have greatly increased. Great credit is given to women and children, whose services are described as "heroic." On many farms they have undertaken to do all the work. In peace times it was not uncommon for women to work in the stables and to do some of the lighter work in the fields, but now they do heavy work as well. One official said: "It is unbelievable what women and children have done. One pities them." It was not uncommon to see two or three yoke of oxen driven by a boy of about ten years and drawing an old-style plow held by a woman.

In sections of Italy where farmers live in villages and go sometimes six or eight miles to work on their little plots of land, it has become very difficult and sometimes impossible for the women and children to carry on the farming operations. In such cases the Government has given such assistance as it could—for example, through plowing the land with the use of tractors and soldiers, and even by appointing some person to take charge of the operations. In this way many thousands of acres have been retained in service.

Farm labor now receives about four times the normal wage. For example, before the war wages varied from 3 to 7½ francs a day; they now amount to 15 to 30 francs a day. Furthermore, a day's work on

a farm is limited to 10 hours, and in some districts to only 8 hours, a higher rate being required for extra time. It is not surprising to be told that Italian farmers who are too old to serve in the Army or who are exempted for other reasons, and their families, work very hard. The shortage of labor is, of course, primarily due to the large number of enlistments for service in the Army, but also to the withdrawal of other men to serve as laborers. About 60,000 Italian workmen have been sent to France for different forms of labor behind the lines. Many prisoners also, taken in Italy, have been sent to France. Many thousands of workmen were required to make highways and railroads in the mountains in the north of Italy.

This year the farm-labor situation was so serious that crops were in danger. The War Department recognized the need and released for harvest work the troops stationed throughout the country and known as territorial troops. Also, they released for harvest work the entire 1900 class of young men. All of these were compelled to work on farms.

The Army allows, also, leave from military service to farm proprietors or to principal farm operators when their presence is necessary to assure food crops and providing the farm to which they return produces a gross value of crops not less than \$12,000. Also, small farmers of the peasant class may be exempted for agricultural work when no male between 16 and 65 years of age remains on the farm and the help of a man is deemed necessary. Such persons are released on leaves of absence running three months, which may be renewed for the same length periods. Exemptions are granted also for three-month periods which may be renewed, if circumstances require, to vine and tree (especially olive) pruners; mechanics and engineers employed on large farms; experienced milkers in large dairies; chief teamsters and stable foremen; tree grafters and some other experts. But all exemptions are limited to men of 35 years of age or over, and the total number of such exemptions for all Italy is limited to 120,000.

Exemption from military service is allowed to agricultural advisers stationed throughout the different provinces and 26 years of age or older. But this is not considered an exemption, as such men are taken into the Army and then ordered back to their agricultural work. They are not permitted to serve in the Army even if they want to. No exemption is given for agricultural or other experts stationed at the universities, but it is recognized that some of these men should be retained in their scientific work in the interest of food production.

Enemy soldiers who have been taken prisoners are used in three ways—for agricultural work, for work in the forests and mines, and for miscellaneous labor behind the lines. In agricultural work the prisoners are usually kept scattered with less than ten in a place and always under guard. As a rule, the prisoners and Italian soldiers

are paid about the same as civilian labor, but the payments go to the Ministry of War. In order to get more satisfactory help from such labor it is customary for the farmer to make an allowance of extra food and wine.

The labor shortage has been so great that the Government also is using civil prisoners and convicts for different kinds of work and, of course, under guard.

REPORT OF WM. A. TAYLOR.

ENGLAND AND WALES—INCREASED ACREAGE OF HUMAN FOOD CROPS AND DECREASE OF FEED CROPS AND GRASS.

One of the most conspicuous effects of the war on crop production in England and Wales is the increase of acreage of crops more or less directly available for human food such as the important cereals and potatoes.

The decrease of acreage of forage crops, such as pulse, roots, hay, and pasture is also conspicuous.

Thus the cereals and potatoes show the following contrasts:

	1918	1917	1905-14
Wheat, barley, oats, rye (acres).....	6,979,130	5,637,190	5,294,286
Potatoes..... do	633,840	507,990	434,949
Total..... do	7,602,970	6,145,080	5,729,235

The cereals show an increase of 23.8 per cent over 1917, and 32 per cent over the 10-year pre-war average. This is the largest acreage of cereals since 1879.

Potatoes show an increase of 25 per cent over 1917 and of 45 per cent over the 10-year pre-war average. This is said to be much the largest acreage of potatoes on record.

The acreage of peas and beans, which to a large extent are raised for stock feed, shows a decrease of 0.034 per cent below that of 1917 and of 0.041 per cent below the 10-year pre-war average, while the acreage of grass, including both hay and pasture, shows a decrease of 0.079 per cent below 1917 and of 0.083 per cent below the 10-year pre-war average.

While the wisdom of this enlargement of human food and horse crops at the expense of cattle, pig, and poultry forage, in view of the war emergency, is not to be doubted, when taken in connection with the adverse season for roots it explains in large part the acute situation now existing with respect to shortage of stock feed. This has been accentuated by the necessity for taking unexpectedly large tonnage for troop transport from America which might otherwise have been available for importation of concentrates.

In view of the prolonged and extreme depletion of manpower due to withdrawals for military service, the 10.2 per cent increase of land under cultivation, amounting to 1,152,620 acres in England and Wales, is evidence of the energy and effectiveness with which the farmers

under the leadership and with the assistance of national and local authorities have met the urgent need for larger home production of staple food crops. While in the main this has been accomplished through persuasion, drastic action even to the extent of dispossessing inefficient tenants and of taking, clearing, and operating idle land at the expense of the owner and regardless of his desire, was in some cases taken. Authority for this was found under the Defense of the Realm Act, maximum production of essential crops being considered a public necessity in the face of which adverse private and individual interest must give way. In like fashion the planting of certain very profitable cash crops such as mustard was restricted by local authorities in favor of staple food crops and reduction of acreage of such crops as strawberries and hops was accomplished through persuasion and the influence of public sentiment.

SEED SUPPLIES.

This vital essential to crop production received much attention in both France and England. In the former country, which under normal conditions exports both field-crop and vegetable seeds much more largely than she imports them, little special governmental action was taken other than restraint of exports through requiring the securing of permits for export shipments of seeds. The most notable exceptions appear to have been winter wheat, spring wheat, and sugar-beet seed.

To make possible the largest production of breadstuffs considerable importations of Canadian spring wheat were made both in 1917 and 1918. Though this grain is commonly but little grown in France, 10 per cent of the total wheat acreage in 1917 and 6 per cent of that of 1918 consisted of spring wheat. While not yielding as well as the winter wheat it appears to have answered a very useful purpose in the food emergency. For sugar-beet seed France had for many years relied on imports from Germany and Austria. These were cut off when the war started, simultaneously with the taking of approximately 80 per cent of the beet-sugar factories and beet-growing territory. Some progress in sugar-beet seed production in France has been made during the past two years but imports of considerable magnitude will be necessary if the French beet-sugar industry is to be reconstituted to any large extent during 1919, which at this date appears doubtful.

In England it was found necessary for the Government to purchase considerable quantities of seed wheat and oats of approved varieties, for sale to farmers. To supplement the forage production several thousand bushels of South African maize was imported. This is a comparatively unknown crop in England, where the seasons are too

short for corn to ripen, but the fields observed were yielding fair crops of forage. Most of this was fed green to cattle, silos being practically unknown.

The apparent certainty that the reconstitution of agriculture in France and Belgium will be well under way by planting time in the spring of 1919 renders the question of effective distribution of the existing world stocks of staple-crop forage and vegetable seeds one of the most vitally important to the food supply of western Europe and America at this time. Clover, lucerne (alfalfa), cabbage, rutabaga, turnip, mangel, and sugar beet are some of the important crops of which the yield for 1918 appear to have been relatively light in most countries. Demands from the farmers in liberated Belgium and France, in addition to those likely to arise in certain of the northern neutrals and probably from Germany and Austria also, render the conditions peculiarly favorable for speculative manipulation at the expense of the farmers who must have seed promptly if they are to produce crops next year and therefore to endanger production in 1919.

Unless through prompt international action the approximate stocks and requirements of the vitally important seeds for each country can be determined as a basis for the administration of the existing export restricting regulations in force in the several countries with respect to seeds, the prospect for prompt restoration of normal production in several of the countries will be seriously impaired. The existing conditions tend to favor the forcing of seed prices to destructively high points and thus to endanger the welfare of our own farmers as well as of those of the allied countries. Prompt consideration of the matter by an International Council on Agricultural Production with vigorous and effective action by the proper agencies in the respective governments would seem the most practical way to handle the matter.

In Great Britain one of the distinct agricultural advances made which appears likely to endure is that accomplished through the so-called "Testing of Seeds Order" of the Board of Agriculture and Fisheries under which sellers of agricultural seeds are required to declare the purity and germination of seeds offered for sale. This is applicable to seeds of all the more important cereals when sold for seed, as well as to the leading grass and forage-crop seeds and the leading vegetable seeds when sold in quantities in excess of from 6 ounces to 2 pounds.

Its operation will insure to the purchaser of seed intended for planting, authoritative information as to the name and address of the seller of the seed, the purity, the germination within six months of sale, and

in the case of many specified seeds the name of the country where grown as well as the name of the variety.

If more than 1 per cent by weight of injurious weed seeds be present the total percentage of such weed seeds must also be stated.

The law is applicable to farmers who sell seed, except that farmers may sell seeds "as grown" to a merchant, without having a test made, in such case merely stating the name of the variety.

Packages of vegetable seeds below a certain weight must reach a prescribed standard of germination. If the seed falls below this standard the fact must be declared at time of purchase.

This step to protect farmers and gardeners and reduce the production risk resulting from the unknowing use of impure seed or seed of low vitality is regarded as a reform of very great importance. It is said to have met with the hearty cooperation of the British seed trade and to have yielded distinctly beneficial results in 1918, the first year of its operation.

SEED POTATOES.

The importance of the potato as the crop most capable of quick enlargement under British conditions to supplement the deficient supply of bread grains was early appreciated in Great Britain. Various methods of stabilizing prices and stimulating production were tried during the early years of the war. As was true in North America, however, the crop of 1916, due chiefly to adverse climatic conditions, fell short of the consuming requirements at a time when the submarine menace to the importation of foodstuffs was distinctly ominous to the national welfare. This brought about unprecedentedly high prices for potatoes for both food and seed at a time when every effort was being made to stimulate maximum production both by commercial growers and allotment holders who were aiming to produce their family supplies. In addition to the control of prices of potatoes for food use, the Ministry of Food accordingly established maximum prices for seed potatoes, by varieties and classes, applicable to the seed required for planting the crop of 1917. In addition to recognizing the difference in value of different varieties of potatoes, the relative values of stock one year removed and two years removed from Scotland and Ireland were recognized by price differences ranging from 25 to 33½ per cent. This was accomplished by establishing three qualities of seed potatoes of each important variety as follows:

- Class I. Seed potatoes grown in Scotland or Ireland in 1916.
- II. Seed potatoes grown in England or Wales in 1916 from seed grown in Scotland or Ireland in 1916.
- III. Seed potatoes grown in England or Wales in 1916 from seed grown in Scotland or Ireland in 1915.

In accordance with a fixed schedule of maximum prices to the grower the price of seed potatoes of each class of each important variety was established. For example, in the spring of 1917 the maximum price to growers of seed potatoes of the 1916 crop of Early Puritan variety in Scotland and Ireland was £12 per ton. At the same time the price of Early Puritan grown in England or Wales from seed grown in Scotland or Ireland in 1915 was £11 per ton, while the stock grown in 1916 from seed of the same variety grown in England or Wales in 1915 was but £9.

The prices of seed of some thirty of the leading varieties were fixed in this way, the effort being to maintain the differences of seed value that are more or less generally recognized by British potato growers. Standard sizes for seed potatoes expressed in terms of mesh of riddle were also set. Apprehensive lest the supply of seed should prove insufficient for the planting requirements, the prices were soon raised considerably above the initial schedule, the government purchasing for sale to commercial planters and allotment holders, seed potatoes to a total value of £200,000.

The exigent conditions of the prospective food supply continuing to some extent when preparation for the planting of the crop of 1918 needed to be made, three lines of government provision of seed were decided upon.

The first, when completed, involved the purchase for sale to growers of 11,000 tons of seed potatoes of varieties immune to the wart disease, for use in districts where the soils are infected with that destructive trouble. The required quantities were found in Scotland, England, and Ireland at an average cost of £8 10s. per ton for the seed. In this way the inevitable losses to be expected from the planting of ordinary sorts on infected soils were protected against.

The provision of adequate supplies of seed of varieties immune to the wart disease is recognized as one of the most vital necessities of the British potato production for the near future. To meet this the Government contracted for the growing in Scotland and Ireland of 1,000 acres of the most promising of the newer resistant varieties in 1918 for seed for 1919, at a cost estimated at £44,000. Availability of immune seed is more necessary because the planting of infected land with susceptible varieties is prohibited by the Wart Disease Orders.

The second line involved the provision of seed potatoes of desirable non-immune sorts to small growers in order to encourage production of home supplies for village and suburban families. This undertaking attained a magnitude of 11,000 tons at a cost of £8 per ton and assisted materially in the carrying through of the allotment holders' movement which marks the English landscape everywhere this year.

The third potato effort was instituted and carried forward until blocked by the German drive in March, 1918. This contemplated the planting of some 13,000 tons of seed potatoes, worth approximately £100,000, in the regions of France behind the British Army lines where both soil and climatic conditions were considered favorable for potato growing. Some 9,000 tons of this seed reached France, but because of the German drive the larger part could not be planted.

POTATO CROP OF 1918.

The securing of the largest possible acreage of potatoes in 1918, being considered a matter of urgent national importance, the Food Controller in January, 1918, announced a policy of contracting with farmers to grow potatoes for the Government on substantially the following conditions:

1. The total acreage grown on each farm or holding in question must not be less in 1918 than in 1917.
2. Cultural, spraying, and harvesting and storing directions of the Board of Agriculture must be followed out.

It was announced at the same time that as from November 1, 1918, the Food Controller would purchase the entire potato crop of Great Britain grown in lots of one acre or more, except where grown for consumption on the grower's farm or for experimental purposes or for seed potatoes.

Basis prices for England and Wales and for Scotland were announced at the same time. These were established on an increasing scale from November 1, 1918, to May 1, 1919, and as will be noted from the following table were higher for England and Wales than for Scotland. It was also announced that the purchase price would eventually be assessed with due regard to the size and quality of the crop, but in no case less for sound potatoes than the following scale:

Potato prices.

Time of delivery.	Price per ton.	
	England and Wales.	Scotland.
November and December, 1918.....	£5	£4 10s.
January and February, 1919.....	£5 10s.	£5
March and April, 1919.....	£6	£5 10s.
May, 1919, to end of season	£6 10s.	£6

The prices for seed and undersized potatoes will be announced in due course, but every grower will have the right to retain any seed he may require for his own use.

The higher price basis for England and Wales was expressly stated to be for the purpose of stimulating production in the territory nearest the principal consuming areas and in recognition of the fact that

Scottish farmers obtain their seed cheaper than English farmers and secure higher prices for it when sold.

GOVERNMENT PURCHASE PRICES FOR POTATOES AS DETERMINED IN THE AUTUMN OF 1918.

During hearings in fifteen potato-growing sections of England and Wales, which extended through the month of September, 1918, effort was made to ascertain the approximate cost of production in each district and to some extent the difference in cost of production of different varieties or types of potatoes.

The prices announced late in October were as follows:

In accordance with an announcement made at the beginning of this year, the Food Controller on November 1 will take control of the whole potato crop of England and Wales. The arrangements in respect of the Scottish and Irish crops will be announced later.

The prices to be paid to the growers have been fixed by a Commission, under the chairmanship of Mr. Rigby Smith, K. C., M. P., appointed by the Food Controller and the President of the Board of Agriculture jointly. The report of this Commission has just been issued. It prescribes different growers' prices for different areas, according to the size of the crop and the quality of the potatoes.

The prices per ton, free on rail, during November and December for Grade 1 potatoes (King Edward, Golden Wonder, Langworthy, What's Wanted, and Main Crop varieties) are as follows:

Sussex, £8; Wilts, Hants, Berks, Bucks, and Oxford, £7 10s; Kent, Surrey, Herts, Neds, Middlesex, Dorset, Somerset, Gloucester, Devon, Cornwall, Suffolk, Lancaster, Cheshire, Monmouth, Wales, £7; Hereford, Worcester, Warwick, Shropshire, Stafford, Derby, Leicester, North Hants, Rutland, Northumberland, Cumberland, Westmoreland, Durham, £6 15s.; Nottingham, Yorkshire, and other than blacklands in Lincolnshire, Soke of Peterborough, Norfolk, Cambridge, and Hunts, £6 10s.; blacklands in Soke of Peterborough, Lincolnshire and Norfolk, £6; blacklands in Cambridge and Hunts, £5 15s.

Prices for Grade 2 potatoes (which include all other varieties than those mentioned above) are in all cases 10s. less.

While the prices to producers will thus vary in different areas, the price to the public for the same grade of potato will be uniform throughout England and Wales. Until the end of December Grade 1 potatoes will be retailed at a uniform price of 1¼d. per lb. and Grade 2 at a uniform price of 1d. per lb. Lower prices will be fixed for large retail sales. In January the retail prices will be raised to 1¼d. per lb. for Grade 2 and 1½d. per lb. for Grade 1 potatoes.

The potatoes will be supplied to retailers at a uniform price fixed conditionally at £9 per ton for Grade 1 potatoes and at £7 per ton for Grade 2 potatoes, the price being reckoned in each case to the retailer's nearest railway station. The wholesalers will thus buy from the growers at varying prices, and sell in all cases to retailers at a flat price. In doing so they will act as agents of the Ministry of Food, at a commission which has been fixed, provisionally, at 7s. 6d. per ton, and they will account to the Ministry for the difference between the price paid to the grower and the price obtainable from the retailer after deducting their commission and necessary charges. Both the retailer's buying

price and the wholesaler's commission are subject to revision when further information as to actual cost has been obtained.

DEFICIT AND SURPLUS ZONES.

For purposes of administration England and Wales have been divided into 11 deficit zones, which will need at some time or other during the year to import potatoes from elsewhere, and 12 surplus zones, which will export potatoes (particularly to London and the other large industrial centers). In each surplus zone is a Zonal Committee, under a zonal chairman, responsible for organizing the collection of potatoes for export to other areas. In each deficit zone is a Potato Control Committee, under the chairmanship of the Food Commissioner. These committees will be empowered to issue directions relating to the collection and disposal of potatoes. For example, they may require potatoes of good keeping qualities to be held back until later in the year, so that those which will not keep may be absorbed first.

Subject to any restrictions imposed by the Potato Control Committee or the Zonal Committee, growers will be permitted to sell potatoes to any registered wholesale dealer in their zone but may not sell to anyone else, except under license to be obtained from the Food Commissioner of their area. Sales under such licenses will be made at the appropriate price for the class of sale authorized, but growers of more than five acres will be required, as a condition of obtaining such a license, to pay a fee so adjusted as to secure that their net receipts are equivalent to the growers' price fixed for their district, together with any sum required to cover the cost of additional cartage and a commission of 2s. 6d. per ton. Growers of less than five acres of potatoes will not, as a rule, be required to pay this fee.

The outcome of this effort to stimulate the production of an essential perishable crop through recognition of regional and varietal differences in cost of production and with a view to securing the larger increases in the sections where the article is most needed for consumption is a matter of distinct public interest to the United States. In view of the possibility of the occurrence of similar emergencies in the future its practical workings should be carefully studied as they develop.

FLAX.

At one time considerable fiber flax was grown in England, but as the result of a general decline in special crop production and of competition with the increasing production of Russia the industry had practically ceased to exist many years ago. In 1913, however, experiments looking toward the revival of flax production were begun at a Flax Experiment Station established by the University of Leeds at Selby in Yorkshire, where the conditions were considered favorable for such a test. At that point a considerable number of farmers had had experience in the growing of flax in their earlier years. Thorough test of the practicability of standardizing the retting process and the

practicability of central retting stations for groups of farmers were in mind. This work began with plantings of 117 acres in 1913, and continued on about the same scale of operation through 1914, 1915 and 1916. At points in Somersetshire and elsewhere experimental production of flax was also under way. Under the impetus of rapid increase of prices for fibre and the urgent need of it for airplane construction, the acreage of this crop in England rose in 1918 to 18,400 acres, more than seven times that of 1917, and said to be the largest but two in the past fifty years. Those in charge of the very active government campaign for flax production appeared confident that the quantity and quality of the crop would be found to justify the effort put forth and the large expenditure made. While much had been expected of pulling machines recently developed in America for the harvesting of this crop, we were informed that in England recourse to hand pulling had been necessary. This necessitated the employment of English soldiers, women, boy scouts and all other available labor and also the bringing in at heavy expense of a considerable number of men from Ireland experienced in flax pulling.

Farmers who planted flax were guaranteed a return of at least £10 per acre through a price of £8 10s. per ton for the flax in the seed, the Government securing and paying for the labor required for pulling the crop. Where the crop did well yields of 2 to 2½ tons per acre were secured. Deseeding and scutching were to be done with improved labor-saving machinery and canal and tank retting was to be practiced. While Ireland was not visited, we were informed that the flax acreage there showed an increase of about 25 per cent over last year and is much in excess of pre-war production of this crop.

As all information indicates that world stocks of flax fiber and linen fabric are unprecedentedly low as the result of the disorganization of production in Russia, Belgium and Northern France, it would appear advisable that steps be taken to ascertain somewhat in detail through expert investigation, the nature and extent of the progress now being made in Canada, England and Ireland in the development of special methods and machinery for the growth and preparation of this crop.

Some progress has been made with it in the northern United States, especially in Michigan and Wisconsin. It is understood that the chief retarding factors have been variable weather, adversely affecting uniformity of quality and yield of fiber from year to year, and the heavy labor cost of preparing the crop.

WAR GARDENS.

In both France and England the garden is a more universal feature of the suburban as well as the farm home than in most parts of

America. Apparently the possibility of food shortage was realized very soon after the war began and steps taken to stimulate war gardening. In France little more than suggestion appears to have been necessary to bring the full available human power to bear effectively. In Britain local food production societies were organized and local town and District Councils were authorized to take possession of any suitable unoccupied land and allot it to the towns people for planting. The total number of "allotments" thus cultivated in 1918 in England and Wales is estimated at 1,400,000. As the climatic conditions make possible the continued growth of many vegetable crops throughout the winter, as well as during the summer, the addition to the food supply thus accomplished was very considerable. The psychological effect of such activity upon the home forces was also excellent and effective in maintaining morale at home when the military conditions were not encouraging.

ARMY GARDENS.

Early in the war the French made provision for the systematic production of vegetables by their soldiers wherever a sufficient force was quartered for a long enough time to justify such plantings. During 1918 some 7,000 separate military gardens, totaling some 40,000 acres, were thus maintained. These varied in size from a few square yards to several acres and furnished a large part of the fresh food supply for the French troops.

The central feature of the general plan was a 65 acre vegetable plant nursery at Versailles, where seedlings of such crops as cabbage, cauliflower, onions, leeks, and various salads were grown under intensive conditions to a size suitable for transplantation. These were then shipped by motor or rail transport to the places where they were needed for planting out. Between April, 1917, and October, 1918, some 70,000,000 vegetable plants were shipped from this garden in this way, shipments during the month of October, 1918, being approximately 20,000,000 plants. Fifty-six other seedling nurseries were also maintained at different points. This activity, though under the direction of a Lieutenant of the French Army as Chief Garden Officer, was chiefly supported by funds contributed for the purpose by persons interested.

In cooperation with this a beginning was made in 1918 in the establishment of army gardens for the American troops in France through which 146 such gardens were established at various points. Greatly enlarged operations were contemplated for 1919.

The British Army agricultural activities comprised gardens at camps in the home countries where the principal crops grown were

vegetables, including potatoes. In these some six or seven thousand acres were utilized in 1918.

A project for the production of crops on some 50,000 acres in the zone of British occupation in France was inaugurated early in 1918 with a view to producing cereals and potatoes on a large scale. Funds, tractors, implements, and seeds were provided but the operation as a whole was seriously interfered with by the German advance in March. Notwithstanding this, several thousand acres of grain were ultimately harvested by the British forces as a result of the plantings made.

Extensive crop production work was also undertaken by the British in connection with the Salonica Expeditionary Force and in Mesopotamia.

The whole agricultural work of the British Army was under the advisory direction of an Army Agricultural Committee, of which Viscount Harcourt was chairman.

AGRICULTURAL COOPERATION.

The advance of cooperative organization in agriculture in England does not appear to have been materially affected by the war. The advantage of consolidated selling of produce and purchase of feed-stuffs and fertilizers appears to have been rather less conspicuous than in normal times. This was doubtless to a considerable extent due to the fact that the prices of so large a proportion of what the farmer had to sell and needed to buy were fixed by regulation, leaving little to be determined through competitive buying and selling.

The prevailing type of cooperative marketing organization differs from that which is most familiar in this country in that the English association actually buys the produce of its members in competition with other buyers, and having done so sells it for the association account. Any profit on the transaction thus goes to the association for ultimate division among the entire membership rather than directly to the farmers whose produce was sold or through pooling of proceeds of like sales, as is the case in most such organizations in the United States.

The membership and volume of business of existing organizations has increased considerably and the members appear to have turned a larger portion of their individual business through their association channels but not many additional such organizations appear to have been formed.

The general and unusual wartime prosperity of the British farmer has not specially encouraged him to cooperate. Adversity, not prosperity, is the mother of effective agricultural cooperation.

GENERAL OBSERVATIONS.

The thoughtful observer of agricultural conditions in these countries can hardly fail to be impressed with the radically different situation that exists in them.

France, with her long-maintained policy of self-feeding, must in every way exert herself to restore her crop and live-stock production to the pre-war normal at the earliest practicable date. In view of her depleted manpower and of the peasant type of farm operation which is to a considerable extent inherent in the long-prevailing system of land ownership and inheritance, this is certain to be a slow and difficult process. Apparently it will involve largely increased supplies of fertilizer, implements, and the provision of additional agricultural labor to that of the French people. Prior to the war, agricultural production in France appears to have reached the approximate maximum likely to be attained with the available supply of labor, until consolidation of holdings into farm units of more effective operating size makes possible the larger application of machinery in the ordinary operations of the farm. There is every indication that France will need to import cereals, meat, and sugar for a number of years to come in larger proportion than before the war.

In the portions of Britain visited, the maintenance of the enlarged war production of food crops or even a material further enlargement will apparently be determined chiefly by whether it will pay to raise more at home rather than to exchange manufactured goods for the foodstuffs of her colonies and other countries. The undeveloped potential food resources of England are obvious in the large acreage devoted to parks, estates, and game preserves, as well as in the extravagantly numerous and wasteful hedges that characterize the farms. The manpower, notwithstanding the losses during the war, is apparently ample, provided the man and the land are brought into effective combination.

Leaving aside the possibility of future war interference with transportation, the agronomically sound policy would appear to be to concentrate even more largely on live stock and perishables than heretofore and continue to rely in large part on other countries for cereals which, notwithstanding lighter yields per acre, can in many countries be grown and delivered to Britain at distinctly less cost than she can produce them.

For the immediate future, especially the crop year 1919, the production of staple crops in both England and France will depend more upon the character of the weather than is usually the case. This is especially true of winter wheat which has gone into the ground with less fertilizer and with less thorough preparation than is common.

Apparently, too, the crop was being sown later than usual because of the adverse weather for preparation of the land. In France this was due to prolonged drouth; in England to prolonged rainy weather during August, September and October. Under these conditions it appears probable that the production of wheat in both England and France will show material decline in 1919 below 1918, even if the acreage of those years is maintained.

REPORT OF GEORGE M. ROMMEL.

LIVE STOCK CONDITIONS IN EUROPE.

THE UNITED KINGDOM.

Farming and live stock raising are very closely associated in the United Kingdom. Soil and climatic conditions and the innate conservatism of British character are largely responsible for this condition. The British farmer, however, unlike his neighbors in Holland and Denmark, has usually been an individualist. Cooperative effort has had very little support, but it is now a matter of serious discussion among leaders in agricultural affairs.

In a general way we may say that live stock farming in the United Kingdom in normal times has been directed with three general purposes in mind:

a. To furnish manure for the maintenance of soil fertility. The British farmer who merely breaks even in direct profits on his feeding has a profit in the manure. This fact explains the dependence of the farmer on high-protein feeds, such as the various oil cakes. Circumstances and centuries of experience have thoroughly ground into the British farmer's mind that the maintenance of soil fertility is the first and most fundamental problem of farming. It is not surprising, therefore, that grain yields are maintained in Great Britain at much higher averages per acre than in America.

b. To make a direct profit in commercial feeding for meat and milk production. Great Britain has always been the world's most discriminating market for choice meats of all kinds. The home meat products have been famous as the best the world produces. Prime Scotch beef, Southdown mutton, Yorkshire ham, and Wiltshire bacon are conceded to be the world's standards in choice and appetizing meats.

Beef and mutton are produced in normal times on pastures in summer and by straw and roots in winter. Oil cakes form the chief supplements to the ration. Since the war the supply of oil cakes has declined so that meat production has suffered somewhat.

Dairying in England is unique. The dairy cow of England, and to a considerable extent of Scotland also, is a Shorthorn, bred to furnish abundant milk on the rich pastures and to drop a calf which can be fattened for beef. Guernseys and Jerseys have never made much headway commercially, but Holsteins are just now having quite a run in popular favor, the descendants of an importation made from Holland just before the war selling at very good prices.

c. To produce high-class pedigree breeding stock. A greater number of useful breeds of cattle, sheep, pigs, and horses has been developed in Great Britain than anywhere else in the world. Probably half of the world's meat, as well as a large part of the world's wool, comes from animals which trace directly to parent stocks in Britain.

The condition of British herds during the war:

LIVE STOCK IN THE UNITED KINGDOM.

MEAT ANIMALS.

Country and Class of Animals.	1909	1914	1917	1918
United Kingdom:				
Cows and heifers.....	4,360,932	4,595,128	4,514,803	(a)
All cattle.....	11,761,830	12,184,505	12,382,236	(a)
Sheep.....	31,839,799	27,963,977	27,867,244	(a)
Pigs.....	3,543,331	3,952,615	3,007,916	(a)
Scotland:				
Cows and heifers.....	435,110	453,703	441,802	451,949
All cattle.....	1,176,165	1,214,974	1,209,859	1,208,696
Sheep.....	7,323,265	7,025,820	6,873,234	6,863,168
Pigs.....	129,819	152,768	132,945	127,615
Ireland:				
Cows and heifers.....	1,566,806	1,657,205	1,608,207	(a)
All cattle.....	4,740,848	5,091,587	4,945,229	(a)
Sheep.....	4,221,380	3,678,463	3,824,153	(a)
Pigs.....	1,162,444	1,318,366	956,430	(a)
England and Wales:				
Cows and heifers.....	2,359,066	2,484,220	2,464,794	2,577,970
All cattle.....	5,844,817	5,877,944	6,227,148	6,200,490
Sheep.....	20,290,154	17,259,694	17,169,857	16,475,180
Pigs.....	2,251,068	2,481,481	1,918,541	1,697,070
Horses on Farms:				
United Kingdom.....	2,091,743	2,237,783	2,190,318	(a)
Scotland.....	204,490	209,360	210,048	209,883
Ireland.....	528,806	619,028	597,692	(a)
England and Wales.....	1,348,503	1,399,547	1,372,822	1,375,830

a Figures for Ireland not available.

a. Cattle in Great Britain are more numerous now than they were ten years ago, and there has been a steady increase in their numbers during the war. They are not maintained in as high condition as formerly, except on grass. Store cattle are very high in price, and this, with the shortage of concentrates, will cause a decreased amount of feeding during the coming winter. A shortage of native beef in Great Britain may, therefore, be expected from January to May, inclusive.

The beef cattle situation would have been in better shape had farmers early in the war begun to adopt the practice of marketing at earlier ages. As a means to meet the existing feed emergency this is now impossible, as it requires several years' time to put such a change into effect.

b. From the standpoint of numbers alone, dairy cows are holding their own in Great Britain. Thus far the milk supply has been sufficiently well maintained for essential purposes. At the time we left Great Britain, however, there was much concern whether there were sufficient supplies of concentrated feed to keep up milk supplies during the coming winter.

In view of the peculiar system of live stock production possible and usually followed in Great Britain, namely, many months' dependence on grass with a winter maintenance on straw or hay and roots, clover and other leguminous hays are not so common as in most parts of the United States. In fact, they are exceptional. Hay is usually the cutting from a grass crop which has not been pastured. Of the 19 million acres of grass land in Great Britain, in 1918 less than two million acres were grown in a rotation as a hay crop. Alfalfa is unimportant. The protein in the dairy cow's ration is therefore obtained from the concentrated feed. Milling by-products and oil cakes are thus absolutely essential for this purpose. In the rationing of farm animals which the Government expects to put into effect this month (November) preference in all cases is given dairy cows in milk. The ration, however, is under the normal requirement, being 2.4 pounds per head daily of grain offals and 2.4 pounds per head daily of oil cakes.

Those dairymen who have foreseen the winter shortage of cake withheld it during the summer while the cows were on pasture. With the best of conditions and careful economy in the use of home supplies, and with such additional amounts as are made available by importations, the maintenance of the milk supply in England will still be a difficult problem during the coming winter. It will be made possible if the 153,000 tons of oilcake recommended by the Inter-Allied Food Conference to be exported from the United States is approved.

c. Sheep were declining in Great Britain before the war for the same reasons as existed in the United States. They have increased in numbers since the beginning of the war on account of the increase in the prices of wool and meat. The last year saw a decline in numbers owing to the blizzard of April 17, 1917. This storm was the worst in many years. It occurred in the midst of the lambing season and swept over Scotland and northern England with disastrous effect. The present prices for fat ewes are the same as for fat wethers of equal weight. This has sent many ewes to market, especially in the fall of

1917. The labor shortage has also tended to cause the marketing of flocks, especially in those parts of England where lambs and sheep are handled on forage crops. Pastured or "grass" sheep do not seem to have been affected by the labor shortage. These are the three principal causes for the falling off in the numbers of sheep during the year. Considerable criticism is indulged in of the Government's policy in handling the wool clip, but it does not seem to be causing any farmers to dispose of their flocks. The Government price on wool in Great Britain is much less than in the United States, but it is quite a little more than pre-war prices.

d. Pigs were increasing in the United Kingdom before the war. Since then they have declined sharply owing to the shortage of concentrates. The decline during the past year has been marked and the great shortage of concentrated feed expected during the next winter has caused the Government to announce that there will be no concentrated pig feed available for commercial pigs after January 1. Farmers have been given notice to dispose of their feeding pigs by that date.

e. Horses are worth in Great Britain at least twice what they were worth before the war. Farm horses worth \$250 to \$350 each before the war now bring \$500 to \$750. Fine heavy geldings for city trade bring higher prices, sales from \$1,000 to \$1,650 each having been reported.

The military demands have made heavy inroads on the supply of British farm horses, and the increase in the acreage of tillable land has augmented the farm demand. It is said that the war has caused a great increase in the use of ponies and donkeys for light work in cities and towns.

f. Poultry, especially chickens, have fallen off. Like pigs, poultry are largely maintained on purchased feed (grain). Wherever the system of ranging in fields from colony houses is followed the flocks seem to be maintained. This practice, however, is not common. Poultry are not often seen in the stubble fields.

g. Pedigree stocks of all classes are being maintained at or above the pre-war numbers. It is believed that this will continue unless the shortage of concentrates causes the slaughter of some pure-bred herds of pigs, which is unlikely. The physical condition of breeding animals seems to be healthy, although the animals are usually rather thin.

Prices for all kinds of pure-bred animals are high—at least double pre-war quotations. Prices for pure-bred beef cattle and horses are higher than in the United States. It is an important indication of the confidence which British breeders have in the future of the pure-bred live stock business that by far the larger number of the pure-bred animals in Great Britain are bought by British breeders for British herds and flocks.

WHAT THE UNITED STATES CAN DO TO ASSIST THE BRITISH LIVE STOCK FARMER.

Concentrates are today the greatest need of the British farmer. Manure being such an important necessity in his farming operations, the farmer who has no stock to feed or who has an insufficient supply of concentrates is in a very serious situation. The United States should furnish to Great Britain during the coming winter all the concentrates, especially cottonseed cake, which shipping facilities will permit. Not only does a considerable part of the 1919 British grain production depend on this, but a much more vital necessity, the milk supply, depends for its maintenance to a great extent on an adequate supply of cottonseed cake.

REQUIREMENTS AFTER THE WAR.

The British farmer will continue to require large quantities of high protein cakes after the war and will be in the market for them. The British consuming public will be in our markets for as much beef and pork products as we can spare.

The coming of peace will probably cause considerable demands for American horses, both for farm and city use, but this will be offset to some extent by the release of transport horses from the British army. It is an interesting fact to American farmers that the experience of the British army with grade Percheron horses from the United States has been extremely satisfactory, especially for transport and artillery purposes. It is believed that these horses have proved to be more hardy, more active and more courageous than the grades of other draft breeds. This fact is largely responsible for the growing interest in Percheron horses in England. Already some purchases have been made in France, and Percheron horses are found here and there throughout England. Just before the Commission left Great Britain a shipment of 26 mares and 1 stallion landed from Canada and are now in Norwich. A British Percheron Society has been organized, and I am confidentially informed that they propose to send a commission to the United States in 1919 to make purchases of Percherons in the United States for English breeders. The demand for commercial horses will probably develop as soon as it is known how many will be available by demobilization from the British army, as soon as shipping conditions become more normal, and as soon as feed supplies are available in Europe. In other words, we may look for this trade to manifest itself about July 1, 1919.

On account of the sharp reduction in stocks of chickens there may be trade with American breeders. It may also be possible to arrange for the importation of pure-bred Holstein cattle from America, but it

will not be easy to bring about on account of the long-standing objection to the importation of live cattle.

With the foregoing possible exceptions, no restocking of British farms with live stock will be necessary, except perhaps in the case of pigs, which British breeders will be able to take care of without assistance.

On the whole, British breeders will be competitors with American breeders in the world's markets for purebred live stock. They are already looking forward to the demand from continental Europe for animals to restock the devastated areas and to replenish herds elsewhere which have been depleted on account of the necessities of war.

LIVE STOCK IN FRANCE.

Purpose.—The French farmer is a consistent utilitarian. He grows live stock for certain very definite and practical purposes, the most primary motive being the money he can make out of them—either directly in sales or indirectly through the maintenance and increase in soil fertility. The breeds of live stock found in France are unquestionably useful and practical and on their native pastures they not only fit in admirably with farm practice, but they are extremely attractive as well. Few more beautiful sights can be offered the traveler interested in live-stock subjects than a group of Normandy cattle in a river-bound pasture, with a few choice Percheron colts grazing with them, or several teams of four or six white Charolais oxen in each, plowing in a field at sunset. However, one does not get the impression of personal attachment between the man and his animal which is so strongly evident in the case of the British farmer. The French peasant's great passion is the land, and four-fifths of them own the land they operate. Although there are many distinct breeds of live stock in France, which are bred to a type in rather well-defined areas, we do not find the extraordinary development of systematic breeding with elaborate pedigree records which is such a feature of animal breeding in Great Britain and also in the United States.

Specifically we may assign two general purposes for live-stock raising in France:

a. To consume roughage and supply a sufficient quantity of manure to keep up soil fertility. An American soldier remarked that in the French farming villages the social status of the farmer was indicated by the size of the compost heap at his front door. Be that as it may, the compost heap is one of the most conspicuous features of a French rural home. The French farmer is nothing if not practical. For example, he has mitigated requisitioning of farm horses for military purposes largely by the substitution of oxen, and has been financially

the gainer in many cases. Oxen are slow, it is true, but they consume rough feed, they do not become so easily blemished as horses, the manure is more valuable from them, and when worn out they will bring more money for meat than will horses.

b. To produce meat and milk for home and city consumption. Meat does not form nearly so large a proportion of the diet in France as in Great Britain, and meat production is therefore not so highly specialized. With the skillful cooking which is a national trait, wonderful things can be done with an unpromising piece of meat. For this reason careful feeding is not so necessary when a French cook prepares the meat. More veal is used and meat animals generally are fed out at much younger ages than across the channel. This is particularly true with cattle. Big calves, which are neither veals nor baby beef, are common. Breeding stock is kept at the highest possible maximum and young animals are sent to market early, with their weight obtained from the dam's milk and green forage.

Highly specialized dairy breeds do not seem to be common in France. Even the red Flemish cattle of the northeast are praised for their meat as well as for their milk. Cows apparently must be capable of fattening when closed out of the dairy and a calf not wanted for breeding must go to the block as veal or into the fields for work.

Except for Percheron horses, the purebred live-stock business is a relatively unimportant feature of French farming and has not figured extensively in the foreign trade.

The Condition of French Herds During the War (Numbers).

Class.	1913 Dec. 31.	1914 Dec. 31.	1915 June 30.	1916 June 30.	1917 June 30.
Cattle:					
Bulls.....	284,190	231,653	211,343	221,300	214,764
Steers.....	1,843,160	1,394,384	1,262,315	1,321,887	1,295,120
Cows.....	7,794,270	6,663,355	6,346,496	6,337,799	6,238,690
"Breeder" (over 1 year).....	2,853,650	2,549,417	2,581,870	2,678,387	2,677,870
"Breeder" (under 1 year).....	2,012,440	1,829,434	1,884,825	2,032,102	2,016,860
Total cattle.....	14,787,710	12,668,243	12,286,849	12,723,946	12,443,304
Sheep:					
Rams over 1 year.....	293,640	258,447	239,832	209,760	188,204
Ewes over 1 year.....	9,288,460	8,390,863	8,033,886	7,143,685	6,463,720
Wethers over 1 year.....	2,580,810	1,881,295	1,572,236	1,288,250	1,129,320
Lambs.....	3,968,480	3,507,756	3,637,235	2,654,680	2,795,350
Total sheep.....	16,131,390	14,038,361	13,483,189	10,845,280	10,586,594
Pigs:					
Boars.....	38,560	36,179	31,501	27,631	26,090
Sows.....	906,790	802,858	785,989	660,631	628,040
Porks a L'Engrais a.....	2,800,760	2,226,456	1,632,252	1,317,432	1,300,840
Pigs under 6 months.....	3,229,740	2,859,994	3,041,054	2,442,404	2,245,310
Total pigs.....	7,035,850	5,925,487	5,490,796	4,448,366	4,200,280
Horses.....	3,231,000	2,105,000	62,156,000	62,246,000	2,283,000

a Pigs for fattening.

b For December 31.

Ten departments in France have been occupied by the enemy more or less completely since the invasion of 1914. The French authorities estimate that the decline in animals in those districts has been, of cattle 935,954, and of sheep 824,652. The period is from December, 1913, to December, 1914. Some of the animals were moved into other sections of the country and presumably appear in statistics for those departments. The French assume that the live stock in territory wholly and continually occupied by the Germans are entirely lost to France. In departments only partially occupied no increase can be expected so long as the war is in progress.

The figures given above show that the most serious losses have occurred among sheep; that pigs have suffered less seriously, and that, under the circumstances, cattle are holding their own surprisingly well.

a. Cattle have declined in numbers about two and one-third millions since December 31, 1913. However, since the first shock of the invasion there has not been an alarming decrease in numbers—only 1.8 per cent. Furthermore, there are now reported more young cattle under one year of age than before the war. We were told that in certain sections of central France cattle were increasing in numbers. These facts are very encouraging, and if the slaughter of young stock can be prevented during next winter and spring a rather serious crisis will have been passed.

During the summer and early fall the demands of the military operations made it impossible to obtain cars to ship cattle to Paris. Many were therefore driven to market on foot for long distances. At the time of our departure from France the transportation problem was somewhat easier and cattle were coming in freely both by the roads and by rail. The relief of the rail congestion had the usual effect. In addition, France faces a feed situation more serious than exists in Great Britain. Not only has a considerable proportion of her producing area been occupied by the contending armies, but the horses for these armies required relatively larger quantities of French feed stuffs, especially roughage. The number of cattle being received at the Villette market in Paris in mid-October was said to be larger than before the war. There were a few bulls, the rest being cows and steers in equal proportion. The market could not absorb them at the fixed official prices, and the absence of sufficient cold-storage accommodations made the situation difficult. The opinion was freely expressed that after the supply now going to market is exhausted there will be a growing scarcity of native veal and beef, which will become acute during the winter and spring months. The inevitable high prices for live animals which will result will tempt farmers to sell their young stock, and in the opinion of leading agricultural authorities this can only be averted by the importation of frozen beef.

The dairy situation in France has been fairly well maintained, although dairy products are high in price, butter and cheese especially. Like Great Britain, France will need concentrates, especially oil cakes, during the winter. Her own supplies of oil cakes have been seriously reduced on account of her not receiving oil seeds in the usual quantity for manufacture. France grows much more alfalfa and other legumes than Great Britain, but the reduction in her home manufactured oil cakes largely tends to offset this.

b. The decline in sheep production in France has been serious. The invasion, the labor shortage and the high prices for live animals have all combined to cause a reduction in the flocks of approximately 30 per cent. A still further reduction was taking place when we left. The receipts of sheep at the Villette market in Paris were said to be as large as before the war.

c. Pigs in France, while reduced in numbers, are not causing the authorities serious concern. Sufficient supplies of breeding stock will probably remain in any event to permit fairly rapid replacement after the war.

d. The horse supply on farms is below present requirements, but farmers have replaced horses with oxen, so that there has not been a material decline in production on this account. It must be remembered that oxen have always been used for farm work in France. When need arises, therefore, the farmer is able to supplant his horses by oxen without having to familiarize himself with a form of motive power of which he is ignorant. The relatively large number of oxen in the country made it possible for French farmers to meet the heavy demands of the war for horses in a fairly satisfactory manner. In some cases both the supply of horses and of oxen is reduced to the minimum. One farmer, operating north of Paris, said that in normal times he used 25 horses on his farm. The army had taken five this year and if further requisitions were made he would have to cut down his tillage area. On the other hand, in the Gironde, where the replacement of horses on farms by oxen was general, we were told that there were still some horses to be spared. The French Government requisitioned 135,000 horses last spring, mainly for the American army, and that army needs still more horses. The supply of horses for the American army, however, is a military question which is not directly germane to this report.

So far as this question affects the maintenance of production on French farms, it may be said that further heavy requisitions on French farmers are not possible without causing a decrease in the agricultural output and therefore indirectly tending to reduce the morale of the French people. Looking to the future, we may expect that large numbers of the horses now in both the French and American armies

will be made available for the French farmers. It must be said, however, that the horses of neither army are maintained so well as in the British army. There will therefore probably be a smaller proportion of fit horses available when demobilization begins.

Horses in civilian duty in France show the effects of the shortened feed supply and will have a rather rough time of it next winter.

The price of horses in France is about the same as in England, and the increase since the war has been in about the same ratio. Good geldings are worth \$1,000 to \$1,200. The horses bought in France for the American army are said to have cost around \$700 each. At a Percheron stud which we visited stallions were priced at \$2,000 to \$3,000. Weanling Percherons are worth \$600 to \$800 each.

e. Poultry are scarce in France and very high priced. Of all classes of poultry on the markets, geese seemed cheapest. Chickens sell in Paris at about \$1.00 per pound, geese at 60 to 70 cents per pound. Flocks of poultry are seen around the barn yards but rarely in fields. Colony houses on range are seldom seen. High prices and strong demand have combined to bring about what appears to be a considerable decline in the number of poultry.

WHAT THE UNITED STATES CAN DO TO ASSIST THE FRENCH FARMER IN LIVE-STOCK PRODUCTION.

a. The greatest problem of the French farmer for the immediate future is to prevent the slaughter of the large supplies of young cattle which are now on hand. Not only does the meat and milk production for the next two years depend to a great extent on the successful solution of this problem, but an even larger problem, the restoration of the cattle industry in the devastated areas, is linked up with it. Some authorities believe that if the slaughter of young cattle can be prevented, France will have in ten years more cattle than ever before. An ample supply of chilled or frozen beef will probably prevent this slaughter. Reference is made above to the expected shortage of beef during the winter and spring of 1918-19. If this shortage can be made up by importations from America, the solution of the problem may be found. There is a possibility of failure in the fact that French people do not like refrigerated beef. They usually eat meat quite fresh, often with some of the animal heat still remaining in it at the time of cooking. Experimental shipments at reasonable prices should soon establish whether this measure of relief could be made a success.

b. Feed supplies are low in France and importations in large quantity will be urgently needed during next winter and spring. It has been pointed out by another member of the Commission that France has been deprived of considerable quantities of cottonseed

and other oil cakes which were formerly manufactured at Mediterranean ports, but which have not been available during recent years of the war.

c. In regard to live stock, the needs of France after the war are best indicated by the losses which she has sustained, particularly in the devastated area. Roughly, there has been a loss of 900,000 cattle and 800,000 sheep in the departments which have been invaded. Officials of the Government estimate that of these numbers 400,000 were dairy cows and 400,000 were breeding ewes. What losses there were in pigs no official figures indicate. The loss in horses is represented mainly by the numbers which went into the army and were lost in warfare. An estimate that there are 30 per cent less horses on French farms to-day than before the war is probably not far wrong.

Authorities differ as to the relative importance in which animal reconstruction should be taken up. Some place dairy cows first, others horses; some believe that the stocks now on hand will enable the reconstruction work to be carried on without supplies from elsewhere; others believe that tractors will fill the need caused by the shortage of horses. All agree that sheep are badly needed.

So far as dairy cattle are concerned, the Government has already in contemplation making an experimental shipment from the United States, as has been already reported by cable and letter. It is proposed to buy 100 cows and place 10 in each one of the ten departments which have been invaded. Wherever Holsteins have been tried in France they are said to have given satisfaction. Certainly they should be given a trial in Flanders. The results of this shipment will be valuable as indicating how far the United States will be called on for assistance in this regard.

In view of the rather strong indications of the development of a demand for considerable numbers of dairy cattle from the United States, I took the liberty while in Paris, with the approval of the Chairman of the Commission, to exchange notes with the head of the French Live Stock Sanitary Service, suggesting an informal understanding with the Bureau of Animal Industry on the subject of cattle importations. This correspondence is being forwarded direct to the Chief of the Bureau. The attitude of the French official is encouraging and the correspondence can be made the basis of more formal negotiations if desired.

With horses and mules it is to be expected that one of the first sources of supply will be those now in the French and American armies. Naturally the British horses first relieved will go to British farmers. The American armies can do French farmers a service if they are allowed to buy horses and mules, especially the heavier ones, as rapidly as demobilization will permit. There will be no object

whatever in bringing all the American army animals home. If the American army does not need them in France, the French and Belgian farmers should be allowed to have them. Arrangements should and no doubt can be made to insure equitable prices for such animals. They should not be "condemned" and sold at auction.

I am unable to see that the United States can offer French farmers any assistance in rebuilding the sheep industry. Possibly Argentina would be a more promising source of supply.

d. There will in all probability be a considerable demand for poultry for the farmers of the invaded districts. The "Agricultural Relief of Allies Committee," an organization fostered by the Royal Agricultural Society of England, which has been donating live stock, poultry, seeds, and other agricultural materials to these people, finds a very large demand for poultry and has sent large numbers to France. A French official interested in reconstruction work stated that the first animals the returning farmer wanted was some chickens, a rabbit, and then a cow. The introduction of American breeds of chickens would probably have less prejudice to contend with than those of dairy cattle.

GENERAL CONSIDERATIONS.

In the agricultural reconstruction work at the close of the war the farmer of Continental Europe should neither be given charity nor should he be made the victim of exploitation. Neither should the farmers of any other countries be allowed to suffer from the consequences of unbalanced production, from inadequate distribution, or from unwise financial organization.

This general statement leads to the suggestion that agricultural matters in the future will receive much larger consideration in international councils than has heretofore been the rule. American business men on war duty in London and Paris, almost without exception, recognize the importance of agricultural matters in world affairs and at the same time admit their inability to handle them on account of their lack of technical knowledge. An officer of the United States Food Administration in London stated that he had declined invitations to confer with officers of the British Ministry of Agriculture on certain subjects because he felt himself lacking in technical knowledge and there were no representatives of the Department of Agriculture in London on whom he could call.

After the first need is met, after starving, shivering peoples are fed and clothed, crop growing is restored, and live stock herds are replenished, the great problem to be considered is the development of the world's agriculture in order to prevent unbalanced production. No one will predict at this time how the American farmer should prepare

for the 1920 wheat harvest, because no one knows what the consuming nations of the world are likely to need or what other producing nations are likely to do. Neither can anyone offer any predictions as to the American program for meat or wool production in 1925. Why should farmers everywhere rush into the production of such a staple as wheat if on investigation a conservative planting program will satisfy all reasonable demands and provide for unforeseen contingencies? The United States suffered from unbalanced production for thirty years after the Civil War. The rapid development of farming in the upper Mississippi Valley and westward is a splendid theme for a platform orator to use to thrill his audience. Practically, however, it wrecked for a generation the agriculture of the North Atlantic States; it stopped the growing of wheat in England and in the very land where this development took place "a farmer" in the nineties was a by-word for an unwise, short-sighted individual. In Iowa at this time the bright boys in the farm family were the favored ones and, if the father could afford it, received an education to fit them for a profession or for business. The dullards, who were not worth an education in the father's opinion, were left to manage the farm. In those days corn was burned for fuel in Nebraska and Iowa farmers welcomed an epidemic of hog cholera because the ravages of the disease sent the market up. The land was not to blame, nor the weather, nor the Government. This calamitous condition was the result of unbalanced agricultural production; more grain and meat were produced than the world's markets could absorb.

For the protection of the American farmer and in justice to the farmers of other countries, nothing should be left undone which humanly can be done to prevent such an unwise development as a sequel to the present war. Fortunately, in the Agricultural Extension Act, and the various services organized under it, American farmers have functions at their command which may fairly be expected to protect them in any probable developments of world-wide agricultural conditions, provided full and accurate information is at the command of the United States Department of Agriculture. This information can not be forthcoming unless the United States Government can answer two questions: (1) What are the prospective food, feed and fiber demands of the world? (2) What are the prospective production possibilities of the agricultural countries? If the Department of Agriculture can forecast the answer to these questions with reasonable accuracy sufficiently in advance of the production of a given crop, the county agents can furnish our farmers with information which will enable them to expand or contract their operations to conform to world requirements. The success of the production campaigns of the Department undertaken during the war in the light of fairly accurate

knowledge of world conditions is suggestive of what may be done under peace conditions with the more accurate information which peace will make available. I therefore venture the opinion that production programs will be desirable in the United States after the war. They will be necessary for the protection of the American farmer and they will have to be based on information which can only be obtained through agents of the Department in European capitals such as London and Paris. Thereby will the American farmer's interests be safeguarded.

Will this be all? Already the American papers are running accounts of the food distress among the people of Austria-Hungary and Bulgaria, and the statement is made that the food shipment program may have to be increased 5,000,000 tons over the first arrangement in order to meet the unexpected food developments caused by the Austrian collapse. Hints are even thrown out that Americans may even be called upon to meet one of the supreme tests of a true Christian—to share their food with those who have heretofore been enemies.

One of the young Americans just out of Russia says that Bolshevism is spreading throughout the Austrian territories and Turkey and that the best cure for it is food. A leather expert in touch with Russian conditions says that next to food the Russian people will need shoes next winter more than anything else. What an appeal these facts will make to the generosity of the American farmer! How they could be used to fire him to sturdy efforts to grow more than America needs! But what of the wheat and wool in Australia, the production possibilities of Russia herself, of Roumania and France? Suppose the Australian wheat were a surplus. What could such a surplus not do to the price of American wheat if suddenly thrown on the market? Let us answer these questions by saying that the American farmer should not be permitted to let generous motives get the better of his sound business judgment. However, Russia may have to be the world's ward for some time to come. If so, the rest of the world has to supply her with food for a year or two, and to supply Austria and possibly Germany even, common sense and foresight seem to urge that as soon as possible the associated nations draw plans accordingly to meet the world emergency. It is not too much to believe that the nations now associated as belligerents will be compelled to have some sort of understanding as to their agricultural production, not only for self-protection, but to fulfill the obligations which they will have towards the people of the defeated nations, and which, for humanity's sake, they can not evade.

Let us pass over the question of the distribution of food, feed, and fibers with the assumption that both on sea and land means will be found to move those products from the producer to the consumer.

There is another aspect of this subject which compels attention to agricultural production as an international world-wide problem. The financial problems after the war will be enormous. True, we Americans do not have to fear the consequences of a bad banking system which caused such havoc in the United States after the Civil War. The United States has a safeguard in a banking system which has stood the strain of the war splendidly. The war as a whole may not have been scientifically financed, but, in the light of the information available, the work has been wonderfully well done. When peace comes and the ledger is cast up, the world will learn where it stands. It will know what interest charges must be met, what sinking funds must be created, what retrenchments made—in fact, the world will then find out that it is financially poor but sound in mind and heart. The job then will be to get to work, meet the interest, create the sinking funds, make the retrenchments, and strive with might and main to create wealth to replace as far as possible that which has been destroyed. It is inconceivable in the first place that such a stupendous financial task can be performed without cooperation among the leaders of the nations now associated as belligerents, and in the second place it is equally inconceivable that the possibilities of agriculture as a source for the rapid creation of wealth could by any chance be overlooked.

Let us consider the relationship of agriculture to war finance in the light of a famous national experiment. As a war measure Great Britain has made a great effort to increase wheat production. As such it is justifiable and the British farmers as a class have loyally cooperated with the government to make the plan succeed. Under the stimulus of a high market price as a guarantee to farmers, the compulsion of law as to plantings and an elaborate organization for administration several million acres of grass land were plowed up and possibly half of Great Britain's wheat requirement was this year grown at home. I believe it was Disraeli who once referred to the British as the most emotional nation in Europe. The success of their wheat campaign has fired many leading British agriculturists with the idea that it is possible to grow all the wheat needed in the United Kingdom. If wheat, why not all necessary staples, and the fetish "agricultural self-sufficiency" comes into being. The Government, through the Minister of Agriculture, Mr. Prothero, and one of his chief assistants, Sir Daniel Hall, are committed to this policy even if (in Sir Daniel's opinion) state ownership of land becomes necessary. Aside from the natural preference of British farmers for grass farming and live stock production and the economy of wheat production in the British colonial dominions, the expense to the British taxpayer for the subsidies the British farmer now receives for wheat growing is somewhere around a

million dollars a day. In France, even, where wheat growing was always important and supplied in peace times most of the nation's requirements, a member of this Commission has estimated the cost of the bread subsidy at two hundred and forty million dollars annually. With the cheaper wheat of Canada, Australia, India, and South America available, such a condition becomes intolerable, because it subjects the non-agricultural classes to a burden of taxation which they will be the first to resent. After-the-war financing will not stand such an expense item and sound economy will demand its elimination. This subject and others like it (wool supplies, for example) should not be handled without expert agricultural advice and participation at the council table. The subject of agriculture can not escape consideration in business management of inter-allied affairs after peace is declared, and it should be handled by qualified authorities and not by men who, well meaning though they may be, are frequently amateurs.

REPORT OF THOMAS F. HUNT.

THE AGRICULTURAL NEEDS OF THE ALLIES DURING 1920.

FRENCH REQUIREMENTS.

War or no war, it seems probable that France will need in 1920, and perhaps for one or two years thereafter, to import wheat, frozen meat, wool, farm machinery, and commercial fertilizers in greater quantity than before the war. This is the general consensus of opinion among French authorities themselves. There follows, in brief summary, some of the evidence collected in support of this statement.

WHEAT.

The estimated wheat production for 1918 is $6\frac{1}{2}$ million metric tons. For reasons stated elsewhere there may be not more than 5 million tons raised in 1919. The requirement for 1918 has been placed at 7,175,000 metric tons, including 900,000 tons for seed. This is based upon bread made by the substitution of 20 per cent of other cereals. If the requirement for 1920 is based on white bread, 7.8 million metric tons of wheat will be required for human consumption. To this must be added the seed requirement, 900,000 metric tons, making a total of 8.7 million tons, of which France may be expected to produce 5 million. This leaves 3.7 million metric tons, or 137 million bushels, to be imported in 1920.

BARLEY.

Wheat, says the French expert, should be favored in place of barley. From an importation standpoint barley is chiefly interesting as a wheat substitute. Last year it was necessary to use barley as a diluent of wheat flour. Hence there was not enough home-grown barley for brewing. Furthermore, there had been but little carry-over the previous year. In case of peace, France will go back to wheat bread, and will be less interested in barley, since then its own production of barley will more nearly supply its demand. From the standpoint of importation wheat is important also because it takes less space than an equal value of barley and because it has a higher milling quality.

FROZEN MEAT.

The total number of cattle in France has decreased considerably, perhaps 15 to 20 per cent. About half of this decrease was due to loss of occupied territory. The number of calves, however, is normal,

or even above that of pre-war times. Hence the percentage of loss of mature animals is much greater. In order that the cattle supply of France recuperate quickly, the farmers should hold back from market their young stock, and frozen meat should be imported while these young animals are becoming mature. Whether this will occur depends, of course, on relative prices. It would seem probable that the demand among the farmers themselves, for live animals, in order to consume the pastures and forage, would help to keep their animals from coming to market, and thus induce the importation of beef if prices do not rule too high.

WOOL.

The reasons for it will be discussed elsewhere, but the fact is that there has been a marked decrease—it may almost be said an extraordinary as well as unwise decrease—in the number of sheep during the war. By 1915 the number had decreased 40 per cent. Since then there have probably been further decreases. This not only lessens the meat supply, but also lowers the future output of wool. There is a general consensus of opinion that it will take fibers, especially wool and cotton, longer to catch up with the world's needs than it will the food supplies. France, England, and Germany are all likely to be in the world's market for some years to come, with insistent demands for fibers, which may have an important bearing upon the agriculture of the United States during the next decade. The significance of this remark will be discussed later.

FARM MACHINERY.

It is more or less short lived. Hence there has been not only a considerable loss in the damaged area, but there has been a decrease through normal use in the free portions of France. The shortage of manpower has also caused a greater interest in labor-saving machinery. These and other factors seem to make it certain that there will be an increased demand for farm machinery, using the term in a broad way. For example, there is a marked deficiency at the present time of carts and wagons. Ammunition factories, it is believed by some, will later turn their attention to the production of farm machinery, including tractors, thus making extensive importations unnecessary. Others say that the French do not show a genius for the construction of farm machinery and will not be able to compete with American firms who already more or less fully occupy the field. However that may be, it seems that there will be a considerable demand for American farm machinery, at least during the transition or the attempted transition stage, as the case may be, provided American

factories are themselves in a position to supply the orders. Since the manufacturers of farm machinery are competently represented in Europe it may be doubted whether any suggestions by this Commission can be serviceable.

COMMERCIAL FERTILIZERS.

The one requirement of French agriculture upon which the French authorities are agreed is the need of commercial fertilizers. So emphatic is this feeling that they say one boat bringing phosphates from Africa will be as effective as fifteen boats in bringing food from America. France is also short of nitrogenous feeding stuffs, through the breakdown of her oil factories during the war. It has been necessary for Great Britain to allot sulphate of ammonia to France which she very much needed on her own farms.

TRANSPORTATION.

Over and above these direct agricultural requirements France needs freight cars. Lack of transportation helps to aggravate the shortage of food. Thus, for example, while there is a general shortage of potatoes in France, the situation is made much more difficult because in some places there is an over-supply while in others there is a great shortage. The greater demand for freight cars for moving soldiers and munitions makes it impossible to move potatoes from one point to the other. This applies more or less to all classes of staple foods. The shortage of wheat is made greater by the lack of transportation between Algiers and France. Hay is selling in Paris at \$80 per ton retail, while within fifty miles there are farmers who are having difficulty in making satisfactory disposition of their product.

BRITISH REQUIREMENTS.

A study of the 1920 and future needs of the United Kingdom is made somewhat difficult by the attitude of mind of the British men of affairs. It is to be the settled policy of the United Kingdom to get its raw materials from its outlying possessions, and in return to insist upon these colonies buying their manufactured materials from the home country. It is a part of the policy to keep London the great financial center of the world. Of course, even in pre-war times, there has always been the assumption, more or less fully understood, that this would be done. Now it is a definite and avowed policy, which Premier Hughes of Australia states as "trade first with our overseas dominion, next with our allies, next with the neutrals, and next or not at all with our enemies." When, therefore, one talks to a

Britisher about the future needs of the United Kingdom, his mind instinctively considers not so much the needs of the United Kingdom as the supplies which their own possessions may be able to furnish. The primary object of the Commission was to determine the probable future needs of our allies without reference to the source of supply, and then secondly, how much of this need the United States should undertake to supply, and particularly, whether there was any obligation upon the farmers of the United States to change their agricultural policy to meet these future demands.

SEVEN STAPLE REQUIREMENTS.

Various authorities discussed the following as probably needed by the United Kingdom in 1920 in greater quantity than in pre-war times, namely, (1) wheat, (2) meat, particularly frozen beef, (3) sugar, (4) coffee, (5) feeding stuffs, (6) wool, and (7) cotton.

WHEAT.

All observers insist upon wheat as the cheapest and most concentrated import food. It has a higher nutritive value for the money required. It contains a large amount of food for the shipping space occupied. It has a high milling quality, and the offal has high feeding value. These milling offals are and will be much in demand. Some authorities state the rate of extraction as 85 per cent, while other equally good authorities say that 88 per cent is taken in domestic wheat and 91 per cent in the best imported hard wheat. The best extraction of barley is 68 per cent, while the present Government requirement is 50 per cent. The lower the extraction the better the flour and the more offal obtained for domestic animals, which just at the moment is a consideration of considerable importance. For the best grades of patent white wheat flour the extraction it was agreed should be 72 per cent.

GRASS.

There is a rather general but not unanimous agreement that the increased acreage of plowed land will not obtain permanently. The climate is better adapted to grass than to cereals. The British are willing to pay a higher price for their own meat products than for the imported article. Imported beef, however, is sometimes sold as prime British beef. Our American mutton is, confessedly, below the British quality. The bacon, with its excessive fat and its hard salt cure, which is now being shipped from the United States is distinctly inferior to the American bacon used for home consumption. It is also

pointed out that most of the flour milling is now done at seaports, hence these mills can buy to advantage imported wheat. It is the interior mills which grind the domestic wheat chiefly. They are generally decreasing, both in number and size, because of this seaport competition. The factor that does most to keep them going is the bran, which in addition to being nearer the point of consumption is claimed to be of better quality for feeding purposes. How much of this claim was justified was not determined.

LATE SEASON.

According to observations, as well as statements made, the season has been late. The large crop of wheat has been rather badly damaged by persistent rains. The loss has been variously estimated at from 5 to 25 per cent, the first figure probably being nearer the truth. A representative of the leading milling company which is now grinding the present domestic crop, says that it is the poorest in quality in the history of the country. Since little wheat is yet sown, it seems not improbable that there might be a decrease in the acreage of the 1919 crop. It is claimed, however, by more than one British commentator that there is still plenty of time (October 29th) to plow and seed wheat. If it is sown by December first, say these observers, all will be well, although it is admitted that October seeding is preferred. It is stated also that last year a considerable portion of the newly broken sod was sown to oats. This year that land will go into wheat. Hence the acreage of the latter may be further increased. At least one member of the Commission believes that the acreage of wheat will be less in 1918-19 than in 1917-18 in the United Kingdom.

SUBMARINES.

On account of the submarine warfare, drastic measures were taken to cause the plowing up of grass land and the seeding to cereals and other food crops. In 1917 the total area in England and Wales in grass, including clover and rotation grasses, was 18,334,370 acres. The preliminary statement for 1918 shows a decrease of grass land of 1,650,690 acres, or 9 per cent. Likewise in 1917 the area in cereals was 5,693,200 acres, and in 1918, 7,080,380 acres, or an increase of 1,387,180 acres, which is an increase of 24 per cent. Beans increased 19 per cent and peas 15 per cent. Potatoes increased from 507,990 to 633,840 acres, or 25 per cent. Flax increased from 2,510 to 18,400 acres, or more than six times. The acreage in wheat increased 33 per cent; oats, which exceed wheat in total acreage, 23 per cent, and barley 3 per cent. The acreage of all human foods increased, while the acreage of all crops for domestic animals remained about station-

ary or decreased in the United Kingdom, with the exception of oats, which are now extensively used for human food. The requisitioning of food ordinarily used for live stock has produced a marked domestic shortage of concentrates and of hay. Pigs and chickens are being sacrificed because of this situation, and a marked increase in the price of milk has been allowed. Thus the winter wholesale price of milk has been set at \$5.40 per cwt. f. o. b. farmer's railway station. This price is between three and four times any pre-war prices existing since at least 1880. The estimated yield of wheat in the whole United Kingdom is the largest since 1878. The average pre-war yield for the two years prior to the war, together with the production for each of the following years, is shown below:

Average.	Million Bushels.
1912-13.....	57.04
1913-14.....	62.52
1914-15.....	73.12
1915-16.....	59.77
1916-17.....	64.32
1917-18.....	¹ 93.20

¹ Estimated.

Not since 1885 has the yield of wheat exceeded 80 million bushels until this year.

RELATIVE INFLUENCE OF THE WAR UPON THE AGRICULTURE OF THE TWO COUNTRIES.

It is interesting to note the comparative trend of wheat production in the United Kingdom and France, not alone because of its bearing upon the supply of wheat, but because it indicates in a considerable degree the relative vicissitudes of agriculture in the two countries. Remembering that the average production of wheat for the two years 1912 and 1913 was, in the United Kingdom, less than 60 million bushels, and in France, about 330 millions, and taking these yields at 100, the percentage production during the war period compared to the pre-war production stands as follows:

	United Kingdom.	France.
1912-13.....	100	100
1913-14.....	110	86
1914-15.....	130	68
1915-16.....	105	63
1916-17.....	113	44
1917-18.....	163	73

Statistical data must not be taken too literally, even when one is certain of its accuracy; yet after rather unusual opportunity to observe the conditions in the two countries, we believe that these two columns do not unjustly represent in general the status of agriculture during the war in these two countries. England, for example, is disturbed be-

cause the number of sheep has decreased 4 per cent. Her authorities are quite properly making every effort to increase her flocks. France, however, during the first two years of war, lost not 4 per cent but 40 per cent of her sheep. Assuming the population of the United Kingdom to be 48 millions, and that of France 40 millions, the per capita production of wheat is seen to be as follows:

Production per capita in bushels.

	United Kingdom.	France.
1912-13.....	1.2	8.1
1913-14.....	1.3	7.1
1914-15.....	1.5	5.6
1915-16.....	1.2	5.2
1916-17.....	1.3	3.6
1917-18.....	1.9	6.0

In the United Kingdom the food situation has not been due to a decrease in food production, but to a fear that the submarine might prevent the normal importation. In France there has been a marked decrease in production, requiring large importations, when in peace times the country is nearly, or quite, self-contained. This fact made the British situation the more critical because part of the importations which in peace times would have gone to England, as a matter of course had to be diverted to France. The British are not people who speak of their sacrifices; hence attention has not been called to this aspect of the situation. On the other hand, the British were by no means improvident. There was never a time, even in the darkest days, when they did not have at least three months' supply of wheat in sight.

NORMAL WHEAT REQUIREMENTS.

"The future demand for wheat," says Sir Daniel Hall, "will be about normal. Probably we shall go back to white bread, which will increase the present demand somewhat for wheat." The total importation of wheat in the United Kingdom in 1917 (including flour, in equivalent of grain) was 207 million bushels, while the domestic production was 64 million, making 271 millions. This makes a total requirement, including seed, of 5.6 bushels per capita. It may be stated safely that the production of wheat in the United Kingdom will not fall below 60 million or rise above 90 million bushels during the next few years.

SUBSTITUTES.

These data are based upon a substitution of at least 20 per cent of other cereals in the bread. The United Kingdom finished government regulation flour must contain 20 per cent flour from permitted

cereals, but when the miller uses English wheat a deduction is made, with an average of 15 per cent, and in some cases 10 per cent. The admixture depends on the district, the gluten of some wheat being stronger than others. Potato flour is permitted but not specified. If, therefore, the wheat requirement is increased to replace the substitutes now employed on the basis of 20 per cent, her annual importation should range between 245 million and 275 million bushels. Her pre-war importations averaged about 220 million bushels annually.

SUBSIDIES.

On the other hand, the consumption of bread may decrease since presumably its price as related to other food will increase after the war. If the estimates of the British and French Governments as to the cost of wheat subsidies are correct, the present price of bread in those two countries is about two-thirds of its actual cost. According to their estimates a pound of bread costs each of the governments between 7c. and 8c., while it is sold to the consumer at 5c. a pound. It is scarcely to be supposed that the policy will continue of taxing the whole people in order to maintain a low price on a single food commodity. Just how much influence the increased cost of bread may have on consumption it is impossible to predict, but a member of the interallied scientific food council expressed the belief that the tendency during war or other periods of food scarcity was for the consumption of bread to increase, because a greater nutritive value could be obtained for a given cost than from most other staple foods. There is a general consensus of opinion, at least in trade centers, that Europe will go back to white bread as quickly as possible after peace is declared. The United Kingdom and France may need, therefore, to import during the year 1920 from the crops of 1918-19 probably not less than 350 million nor more than 425 million bushels of wheat.

ITALY AND BELGIUM.

To this must be added the requirement of Italy and Belgium. Italy normally imports 50 million bushels of wheat annually. During the last year she imported 118 million bushels, while her requirement for the coming year is about 90 millions. Since her 1918 crop is estimated at 160 million, her total requirement, including seed, is about 250 million bushels or 6.6 bushels per capita. As her 1918 crop is, like that of France, good for war conditions, it seems probable that she will import not less than 100 million bushels during 1920.

Prior to the war, the net importation into Belgium was about 50 million bushels annually. The total requirement of our allies, therefore, during 1920, will probably be at least 500 million bushels. Prior

to the war Russia and Roumania exported something over 200 million bushels annually. Judged by pre-war demands, Germany may need 100 million bushels. It seems not unlikely, therefore, that Germany, Austria and other Balkan countries, will absorb all the available exports of Russia and Roumania, leaving our allies dependent upon the Western Continent and Australia for their supplies.

WORLD'S PRODUCTION OF WHEAT.

It will not be without interest in this connection to study the world's production of wheat for the last 5 years in which data are available. The year 1915 is the last year in which data are sufficiently complete to make an estimate of a total production practicable.

World's production of wheat.

[From data compiled by Bureau of Crop Estimates, U. S. Department of Agriculture, in million bushels.]

Continent.	1911	1912	1913	1914	1915
North America.....	864	966	999	1,057	1,457
South America.....	170	197	216	136	192
Europe.....	1,957	2,144	2,392	1,958	2,024
Asia.....	425	421	415	358	427
Africa.....	86	68	87	71	92
Australasia.....	107	81	100	112	33
Total.....	3,611	3,879	4,209	3,692	4,225

The weather is the greatest single factor of the food supply of the world. Sufficient attention has not been paid to this factor. No one would maintain that the conditions were favorable throughout the world for the production of wheat in 1915 from a standpoint of labor, and yet there was gathered the greatest harvest that has ever been obtained. This result was secured notwithstanding Australia had one of the most disastrous seasons in her history. North America produced in 1917 at least 550,000,000 bushels less wheat than in 1915, although without any doubt just as extensive effort was made to produce it. In other words, weather conditions caused a drop in production equal to over one-eighth of the total world's supply of wheat. No one can determine with any degree of accuracy how many years it will take to reach the normal balance of food supply, because no one knows what the weather is going to be. Two unusually abundant crops of wheat in succession might fill the granaries of the world. Three lean seasons may continue the food shortage for five years. The greatest dangers to be anticipated, however, are (1) difficulties of transportation and trade, and (2) inability through disturbed conditions of individuals to employ their time to economic advantage. The former may cause local shortages of food, the latter an inability to purchase it.

MEAT.

Perhaps the most important evidence that meat will be in even greater demand after the war is that, without any material decrease in the domestic meat supplies of the United Kingdom, the nation has had to go on a very strict meat ration. Compared with the pre-war period, cows and heifers in Great Britain are in 1918, 16 per cent more numerous, while other cattle have increased 3 per cent. Sheep have decreased 9 per cent and hogs 27 per cent. From an importation standpoint the decrease in hogs is not especially significant, since the total number of pigs in relation to population is small. In Great Britain, for example, there is less than one pig to twenty persons, while in the United States there is one to two persons.

Number of cattle, sheep and swine in Great Britain during decade.

Kind of stock.	1903-13	1914-18	1918
Cows and heifers.....	2,773	2,924	3,030
Other cattle.....	4,259	4,406	4,379
Total cattle.....	7,032	7,330	7,409
Sheep.....	26,041	24,256	23,338
Swine.....	2,489	2,281	1,825

Since cows and heifers have increased at the expense of other cattle, the number of meat animals has decreased relatively. The amount of prime beef and mutton has been somewhat decreased because of lack of concentrates and the poor crop of roots. This and other factors have brought upon the market at this season an over-abundance of cattle, some of which the Government has refused to accept. There enters into the problem indirectly a lessened supply of hay through decreased acreage and Government requisitions for the army. In general, therefore, it may be stated that it does not seem probable that the United Kingdom will increase greatly her domestic supplies of meat during the next two or three years. Since it seems reasonable that her consumption of meat, especially beef, will increase as soon as the ration card is withdrawn, her demand for chilled and frozen beef will be greater than at present. Sir Daniel Hall believes that a shortage of imported beef in 1919 will make a shortage of domestic beef in 1920. "Bacon," he says, "will not be available from Denmark and Holland immediately. In the meantime, Great Britain will be thrown upon America for her supply." The imports of meat into the United Kingdom in 1917 were as follows:

Imports of Meat, 1917.

	Cwt.
Beef.....	7,723,944
Mutton.....	2,620,314
Bacon.....	6,567,574
Hams.....	1,180,166
Other meats.....	1,481,504

BREEDING ANIMALS.

While there is apparently good reason to believe there will be, in both France and the United Kingdom, increased demand for chilled and frozen beef, for which carrying capacity should be provided, it does not seem probable that there is going to be any great opportunity or responsibility upon the part of the live-stock breeders of America to furnish Europe with breeding animals after the war. In Great Britain breeding stock has been kept up in anticipation of peace. The breeders of Great Britain are looking forward to an after-the-war trade, not only with the Continent, but with North and South America as well. Their business is in a most prosperous condition, sales during recent months being made at almost fabulous prices.

HORSES.

Some exception may be made with regard to horses. Good farm draft horses are bringing in France at present \$1,000 to \$1,200 each, while high-class horses in England bring similar prices. Rather ordinary farm work horses, in both England and France, bring from \$500 to \$800 each. To what extent the return of the army horses of these two countries and the addition of the now somewhat depleted supply in the American army will satisfy the existing and future demands, is somewhat difficult to forecast. Some account must be taken of the enormous number of army motor lorries and other forms of motor transportation which will be available in Great Britain and France after the war. There are many factors which enter into the use of the latter, such as the cost of operation, the narrow and crooked streets in many of the cities and towns, and the general inertia of business methods. When all these are taken into consideration it would seem that as soon as tonnage is available horses will begin to move from America to Europe and that there will be some foreign demand for American horses until prices on the two continents become equalized.

SHIPPING SPACE FOR BEEF.

Perhaps the most immediate steps to be taken in connection with provisioning the people of Europe is to provide suitable shipping space for frozen and chilled beef. The stocks of wheat in Europe are

ample for immediate needs and there should be no difficulty in replenishing these stocks from North and South America and Australia in ample time to meet all needs. Doubtless there will be some difficulties in local distribution. The distribution of meat and meat products, which has become a world-wide problem, is one of fundamental and lasting importance to the American farmer. For example, the failure of our allies to secure abundant supplies of beef from the United States during the war has not been wholly due to a lack of transportation facilities between England and the United States. It has been partly due to favorable contracts which the British Government could make for beef from Argentina and which they were under obligations to continue. Looking into the future, a thorough study, with a view to further development of the slaughtering, preparation, and distribution of meat products should be made both in this country and abroad. For example, when the inquiry was made that since sufficient carrying capacity was not available for frozen and chilled beef, why canned meats were not shipped, the statement was made that the packers were not able to extend their operations in this direction sufficiently to meet this situation.

SUGAR.

There is one article of food which both France and England ration in common. It is sugar. France rations bread and sugar by means of food cards and these only. England rations beef, mutton, poultry, butter, margarine, lard, and sugar. Both also restrict the use of milk as a beverage. The people of both these countries would consume more sugar if they could get it. The shortage in supply is primarily due to the fact that Germany has destroyed much of the French production and her own is not available to the Allies. As stated elsewhere, a most important agricultural loss in the devastated areas of France is the sugar-beet culture. It is estimated that 80 per cent of the sugar-beet factories of France have been destroyed, and that it will take two years after peace is declared before they can be rebuilt and operations resumed. Germany, on the other hand, will be ready to resume operations at once wherever they have ceased during the war.

COFFEE.

There are three great products in the world that have not changed in price materially during the war. They are, wheat in Australia, horses in North America, and coffee in Brazil. Lack of tonnage, or, more strictly, a greater need of tonnage for other commodities, is the answer in each case. As soon as peace is declared an increased move-

ment of coffee may be anticipated. This may seem unimportant in North America, but it must be remembered that the coffee planter of Brazil uses many imported articles, including food supplies. Brazil must therefore decrease her imports unless she can export her coffee.

FEEDING STUFFS.

There is a most insistent demand for concentrated feeding stuffs on the part of Great Britain. For example, it is estimated that Great Britain needs 791,000 tons of milling offals and grain between October, 1918, and April, 1919, of which she has in sight 706,000 tons, or a shortage of 85,000 tons. Of oil cakes and meals she needs in addition during the same period 578,000 tons, of which she has in sight 425,000 tons, or a shortage of 153,000 tons. The total estimated shortage for the coming season is therefore about 18 per cent of the normal requirement. The total consumption of oil cakes in the United Kingdom given in long tons, (2,240 pounds) has been as follows:

	Oil cakes and meals.	Cottonseed meal only.
1913.....	1,378	733
1914.....	1,264	702
1915.....	1,426	617
1916.....	1,213	462
1917.....	845	311

A live-stock authority said he felt the demand would swing back to cottonseed meal, notwithstanding the great development of the oil industry in Great Britain during the war. In general he thought that if free trade continues, things must go back into old lines because foreign countries can supply raw materials cheaper than Great Britain can produce them.

WOOL.

The same authority states that after the war fibers would be more quickly needed than food and would take longer to readjust. "Supplies of wool and cotton are now very low," he said. Sir Daniel Hall said, "Wool will be short the world over, but Australia has large stocks which will move as soon as tonnage is available." He might also have mentioned Argentina. An expert, in a position to know the commercial supply and needs of the world, dictated the following statement:

French, Italian, and Belgium stocks must be reestablished, and recent deficiency in consumption supplied. The stocks, which have accumulated on account of inability to ship to Germany, Austria, and Russia, will be available for this purpose.

Whether the world's demand for wool in 1920 would be greater than the supply, he would not venture to predict, but said that in his opinion not only the increased production of sheep could be wisely promoted, but also that farming was in general a safe venture during the years immediately to come.

COTTON.

The British as well as the French believe it will require longer for the world's supply of fibers, cotton, wool, and flax, to meet the demand than it will take the food supply to readjust itself.

DECREASED STOCKS.

The demand for cotton will be insistent, because in normal times it is customary to carry over from year to year greater stocks of cotton than of food. This carry-over by merchants tends normally to stabilize prices, since stocks are accumulated during years of low prices and sold during seasons of high prices. During the war these stocks have been reduced. There will thus be a demand for stocks as well as current supplies.

CURRENT DEFICIENCIES.

There is reason to believe that there will be an increased demand for cotton goods, since some people at least have restricted purchase during the war and will need to replenish their supplies. This applies particularly to household furnishings. The damaged areas of France, Belgium, and Italy will be in special need of replenishing current deficiencies. There is every reason to believe that Germany and the other Central Powers will be in the market for large supplies of raw cotton. This will apply equally to Russia. If Russia is some time finding herself, this will only continue the increased demand to a later date.

NEW USES.

There was a great shortage of cotton, which war conditions has accentuated. Among the new demands may be mentioned decreased prosperity of the world's population, and the successful substitution of cotton as a cheaper raw material in place of wool, linen, and silk. Processes have been applied to the manufacture of cotton by which fine fabrics are brought within reach of all pocket-books.

SUPPLY OF FLAX.

Flax will probably rule high for many years. There will be a tendency to substitute cotton wherever possible.

LONG-STAPLE COTTON.

John A. Todd, Professor of Economics, University College, Nottingham, divides the cotton supply of the world into five grades, summarized as follows:

Summary of World Cotton Supply, by Grades.

Grade quality.	Staple.	Pre-war prices Oct. 7, 1914.	World's crop.
	<i>Inches</i>	<i>Cents per lb.</i>	<i>Bales.</i>
1. Best Sea Island.....	2 and over.	25-37	15,000
2. Second-grade Sea Island and best Egyptian....	1½-1¾	20-25	502,000
3. Egyptian and Staple American.....	1 - 1½	13-21	1,400,000
4. American.....	¾-1¼	10-14	17,165,000
5. Indian.....	¾ up	7-12	7,200,000

According to these figures a high-grade Egyptian cotton in peace times brought about twice that of American short-staple. There were about 400,000 bales of this high-grade cotton, while of second-grade Egyptian cotton there were 1,000,000 bales. The poorest of this second-grade sold for no more than the best grade of short-staple, while the best of it sold for about 50 per cent more. The question is, therefore, whether on account of the greatly increased cost of producing long-staple Egyptian cotton over the American short-staple, it would pay to raise Egyptian cotton, if when short-staple is 14 cents, Egyptian is only 21 cents. Unless Egyptian will sell for twice the price of short-staple it may be doubted whether it is an industry that could be safely promoted as a regional wide enterprise. The argument in favor of Egyptian cotton ruling relatively high for some years to come is based on (1) new uses, such as for automobile tires, (2) a restricted production of Sea Island cotton, due to the attacks of the boll weevil and other factors, and (3) the great reduction of cotton in Egypt from the pink boll weevil for which no remedy has yet been suggested, and on account of the waterlogging of the cotton fields of Egypt from over-irrigation. While there is evidence that these factors will operate to a greater or less degree, the fact remains that the price of long-staple cotton is more or less speculative. There is always a steady demand for short-staple cotton (between ¾ and 1¼ inches), but in the case of longer staple there is often considerable fluctuation in the market price. On the other hand, there is a large acreage capable of growing short-staple cotton, while the area adapted to the finer grades of cotton is much more limited. It is evident that if one is to undertake to raise an expensive crop like Egyptian cotton, the greatest care should be exercised in using seed of high quality and in taking all necessary precautions to keep the seed from being mixed with varieties or strains of different quality.

POSSIBLE SHIFT IN AGRICULTURAL PROSPERITY.

Statistical data, more or less accurate, may now be set aside and speculation indulged in as to the possible influence of this war, which has engaged some twenty countries and will require nearly, or quite, fifty treaties to close. What influence is it going to have on the material progress of American agriculture and upon the peoples of the several regions so affected? There are many currents and eddies that go to make up the stream. The direction of progress is a composition of forces. The exact effect of several human agencies can not generally be accurately appraised. It is certain, however, that forces of a national and even an international character have been acting upon American agriculture in a way profoundly to affect great regional areas of this country. The prosperity of certain areas has been accelerated, of others retarded. The future can not be predicated because no person has the necessary knowledge of future events, and if he had, he might not be wise enough to assess their significance accurately. It is not difficult to see, however, that if certain classes of farm commodities are in greater demand than others over a series of years, money will flow into those regions in greater quantities and affect the life and activities of the people of the region. For example, the railroad mileage will increase, public and private buildings will be erected, city and farm homes built, the comforts of life increased, and the education of the children promoted. The high prices may indeed be due to a relatively high cost of production, which may make profits no greater than formerly. If, however, more money flows into a region, more development will take place, which is another name for prosperity. And this prosperity will not be greatly affected because labor gets too large a proportion of the money, which is only another definition of the lack of profit. To the man who is about to enter upon the business of farming, and to the Government which essays to lead in promoting agricultural policies, therein lies a problem which may tax the best minds. If certain types of agriculture are for a decade to receive a relatively larger prosperity than other agricultural industries, the children of every farm home in America will be directly or indirectly affected. These factors cause one to think in new terms and to make us conscious that there are certain profound agricultural policies to be inaugurated, which it is no part of this paper to develop. There is an unconscious hint in these observations that the staple farm products have not during and will not after the war be affected equally. Authorities have repeatedly stated, for example, that fibers will be longer coming back to the normal, whatever that may be, than food products. Obviously cereals are more sensitive to economic changes than meat products.

REPORT OF DAVID R. COKER.

I will confine my report of my observation in England and France to a comparatively few points.

I have been privileged to see parts of the reports of several of the other members of the Commission, who are treating at length of the general economic situation in England and France and the special problems of labor, food and seeds production, and concur in their findings, so far as I have been informed of them.

A few of my most vivid impressions are as follows:

English agriculture is in most of its departments tremendously prosperous, and has not suffered very seriously for lack of labor, German prisoners, land army women (to a limited extent), and Government tractor ploughing having largely taken the place vacated by soldiers. The shortage of concentrated feeding stuffs is their most complained of handicap just now. French farmers almost everywhere outside of the devastated areas are also prosperous, though suffering nearly everywhere for labor.

At Cambridge, and also at several other places in England, I heard very flattering reports of a new wheat called "Yeoman," which is a hybrid produced by Professor Biffen of Cambridge, its parentage being Canadian Red Fife-Browick (English). I heard reports of its yielding as high as 100 bushels per acre, which I believe is beyond any previous record. Steps should be immediately taken to see whether this wheat is adapted to any sections of the United States.

The most conspicuous instance of businesslike and successful cooperative enterprise which I have ever been privileged to see is the cooperative fertilizer factory at Kings Linn, known as the West Norfolk Farmers' Manure & Chemical Company, Ltd., operated by the veteran chemist, Mr. Thomas Brown, and his son. Profits to shareholders are limited to 6 per cent plus one-third of all profits over 6 per cent. Two-thirds of all profits over 6 per cent go to share-holding customers in proportion to their purchases. The company analyzes chemicals and soils and advises their customers on their fertilizer and soil problems. The output is 35,000 tons annually. This enterprise will repay study from all who are interested in agricultural cooperation.

The English agricultural rotation, by means of which the lands have been improved, has been badly disarranged by the necessity of increasing the production of bread grains. This, I believe, will react against general production of both cereals and live stock in England until the normal rotation is resumed.

The restoring of agriculture in the devastated areas of France and Belgium is, of course, one of the greatest problems of the war. French and English economists believe that the actual work of rebuilding should be done by the Germans and with German materials. They call attention to the fact that after the Franco-Prussian War Germany for several years occupied French territory with large armies of men who were badly needed in German industries, while all French labor was actively at work. They say that within seven years after the close of this war France had increased in wealth more than Germany, although the French had been compelled to pay an enormous indemnity. It seems evident that Germany should be required to employ in the actual labor of reconstruction at least as many men as are used by the Allies in occupying conquered territory. They should also be required to supply all possible material for reconstruction, besides being compelled to return or replace all tools, machinery, and raw material taken from the Allies.

I was much struck with the Frenchman's dependence on wheat bread and wine as the basis of his diet. I assume that it will not be easy to induce the French to change their long-established dietary. The lack of variety of cereals, however, strikes an American who is accustomed to a great variety of cereal diet (consisting of wheat, corn, rye, rice, and oats prepared in very many different ways) as a real hardship, and France's food problems would be greatly simplified if the people could be induced to adopt some of this variety. Their food problems also would be simplified if a large part of their vineyard area were devoted to the production of food.

There is practically a fruit famine in England and France (except grapes in France). Prices on apples, for instance, vary from 24 cents to 84 cents per pound, wholesale or retail, at different points visited in these countries. It would be desirable to encourage the exportation of fruit to these countries, if tonnage is available, during the next nine months.

It is the general impression in France and England that the world's food supply is not going to be plentiful for several years, the time depending upon how long the Central Empires, Russia, and Roumania are in returning to normal production. I think this opinion is well grounded, and believe the production of staple foodstuffs in this country will be a fairly safe business for at least two years.

Well-posted experts also are confident that the demand for all kinds of textile fibers will exceed the supply for several years. This appears to me to be even more evident than that there will be a food scarcity after 1919. The supply of American cotton in Liverpool when our commission sailed was about 100,000 bales, of which only 10,000 were unsold. Mill buyers were actively looking over the market for cotton

suitable for certain purposes, and were buying from one to five-bale lots wherever they could find them. As soon as transportation can be found a large amount of cotton should be forwarded to Liverpool, Manchester, and other foreign ports, not only to be available for the immediate needs of the Allied countries, but to be on hand there for export to the Central Empires as soon as they are allowed to handle our raw materials.

While I believe the laws of supply and demand will operate to restore cotton to and keep it on a most profitable basis for several years, I think it would be advisable for the Department of Agriculture to continue to stress the necessity for the production in the cotton belt of ample foodstuffs (including live stock) for home consumption. I believe the present price at which cotton is selling is much too low. This opinion is based on the theory that the war is about to end; that there is an accumulated deficiency of textiles in practically every country of the world; that the past three crops have only been approximately equal to the decreased spinning capacity caused by the war, and that lack of potash and labor foreshadows another short crop in 1919.

The immediate future of the cotton industry of the United States will depend very largely on the transportation situation throughout the world. Nothing can be more important than ample ocean tonnage and moderate freight rates.

The comfort, pleasure, and success of our trip was due very largely to the energy, tact, and resourcefulness of our chairman, Dr. Thompson. Mr. Wilmuth, our secretary, was indispensable. He worked early and late, and was always at the service of any member. With unflinching good humor and genuine business ability he served the commission most ably.

I will be glad to amplify, either in writing or by personal interview, on any of the subjects which came under my observation while abroad. I regret that the effects of a cold and seasickness prevented my writing a full report before my landing, and the pressure of accumulated affairs at home has necessitated my concentrating this communication into a very brief form.

REPORT OF GEORGE R. ARGO.

While I was with the Commission the greater part of the time abroad and intensely interested in all phases of the many problems which were being investigated, my report will be confined to the cotton situation and other questions closely related with which I am most familiar.

England seems to have been a greater sufferer for lack of cotton than any of the other Allied countries, owing to the inability to supply her enormous spindleage with a sufficient quantity of raw material to furnish full-time employment to her mill operatives in the great manufacturing cities of Manchester and Lancashire. France has not been affected by this shortage to such an extent as England, due to the fact that her largest cotton manufacturing city, Lille, has been in the hands of the Germans, and her cotton industry has been confined to the manufacturing section of Normandy, near Havre. Very little is known regarding Italy's supply of cotton except that her supply is practically exhausted and her needs are claimed to be more insistent than France or England on account of a diminished wool supply. This question has just been given consideration in London at a meeting of the Allied Maritime Transport Council, where the cotton program for the coming year was presented. Italy asked for more cotton for her 1918-19 requirements than was imported during the pre-war period based on a seven-year average, while the other Allied countries asked for their percentage based on present allotments and the lowest quantity that would keep their mills operating. Italy was asked to explain why such a large allocation was requested, but no satisfactory explanation was forthcoming, though her demand for this quantity was quite insistent. The pre-war figures were 136,000 tons of American cotton and 201,000 tons of all kinds. The Committee finally allocated 110,000 tons of American and 60,000 tons of other kinds of cotton to Italy, with the promise that if tonnage was available a larger quantity would be given, and an investigation is now being made to determine Italy's right to a larger allocation of cotton.

England's cotton mill workers have not benefited as other workers by increased wages and additional work, owing to the shortage of raw cotton. Mills are restricted to running not more than 50 per cent of their spindleage for 45½ hours per week, and many on less time, unless engaged on Government work. The Government has a system of remuneration, however, for operatives that are out of employment on account of the restrictions in mill operation in order that the operatives may be kept at home for work after the war. I was told

that the shutting down of mills in Lancashire during the week beginning October 20 on account of a shortage in cotton cost the Cotton Control Board 185,000 pounds sterling. No rationing system to mills has yet been found necessary, though if supplies of raw cotton should become smaller, such a course will have to be adopted. Some cotton has been borrowed from one mill to supply another temporarily on one or two occasions.

The textile industry in Belgium and Northern France is believed to be entirely destroyed, as the Germans stripped all mills of their machinery and removed it to Germany. A great part of this machinery will in all probability be replaced by the United States, as I am told American cotton mill machinery had been put in some mills in Lille just before the outbreak of the war to supplement old-style cotton machinery and gave great satisfaction. Many of the mill operatives have, of course, left these districts and obtained employment elsewhere, and it is an open question as to whether they will return to their old work or remain in their present employment. The opinion seems to be that the greater number will return as soon as reconstruction provides employment for them.

With reference to low-grade cotton, I have official advice that a number of cotton mills in England are equipped to use the lowest grades of cotton. However, the idea of insisting that a percentage of the lower grades be purchased with the higher grades is not pleasing to the cotton merchants in Liverpool. They stated that the mills would refuse to accept any cotton below middling in grade, and that the low grades would be left on their hands and they would be compelled to carry the burden. This burden has, of course, been carried by our own merchants and farmers for the past two years. A similar situation has developed with reference to wool. The best grades in Australia have been taken off the market for the last two years, and a large stock of low grades left, which are practically unsalable, as our low-grade cotton was last year and is at the present time. The British Government has advised representatives of the War Industries Board in London that it will be necessary for us to take an "average" grade of wool next year. It would seem that such an arrangement could apply with reference to cotton, though if the present crop is of good grade, a smaller percentage than an "average" could be allotted with each purchase. England naturally has to absorb much Indian cotton now, and it is the lowest grade of cotton produced and of the most inferior staple. Before the war Germany and the continent absorbed a large proportion of the Indian crop as well as our own low-grade cotton. Samples shown me of material that is now being manufactured by England's mills from Indian low-grade cotton, however,

indicate that remarkable progress has been made in its use by England. Our low-grade cotton is much superior to Indian cotton, both in quality and staple.

The British Government has fixed a price on Egyptian cotton and taken over the entire crop. The price fixed is less than our sea island prices, which has resulted in very little sea island being exported from this country to Europe. Egyptian cotton is used to a great extent by England for airplane fabric.

The present scarcity and price of cotton has aroused renewed interest in Great Britain as to her future source of supply of this product, and as soon as hostilities are over every effort will be made by the British Government to promote the growth of more cotton in her own colonies. Vast irrigation schemes have been planned by the British Cotton Growing Association, but owing to the large amount of money involved it will take several years to accomplish any definite results. We can rest assured, however, that every effort will be made by Great Britain to have her future cotton supplies more nearly within her own control, especially if the high prices now prevailing continue. Much anxiety seems to be prevalent in England with respect to prices when peace is declared. It is well known that the Central Powers have no cotton; the Entente are at their lowest possible margin, and some system of allocating or rationing for a period of time would be welcome in order that very high prices might be avoided and each country obtain a certain quantity of raw material.

Mr. Huntington, United States Commercial attaché at Petrograd, who returned to this country with us, stated to me that the large cotton mills in and around Moscow were practically shut down on account of being unable to obtain any cotton, and, while he could not state positively, he thought very little cotton, comparatively, would be produced in Russia this year. As soon as some satisfactory financial arrangements can be made Russia will no doubt want a great deal of cotton.

The total quantity of raw cotton provided for in the program for 1919 calls for about 3,600,000 bales for England, France, and Italy. This is the minimum that must be supplied to enable their mills to keep running and operatives at work on a satisfactory basis.

Japan has increased her spindleage to a marked extent during the last two or three years, and this fact is causing much concern in English cotton circles with reference to future foreign trade. No definite figures as to Japan's present spindleage was obtainable, but her purchases of cotton in the United States and India indicate that the increase in spindleage has been enormous.

The cotton exchanges in Liverpool and Havre are under restrictions which practically make them useless as a hedging medium. This is

especially true of Havre, where trading in futures has practically ceased. In Liverpool the contract is used largely for straddling operations with New York. No spot cotton has been delivered on contract since the "war emergency" contract has been in operation. The price of American cotton in Liverpool is based on the average price of good middling cotton in three Southern markets in the Eastern belt of the United States for Eastern cotton and three Western markets for Western cotton. The markets now being used for this purpose are Norfolk, Augusta, and Savannah, in the East, and Galveston, Houston, and Dallas in the West. They have an American Official Valuation Committee that fixes a price each day for which cotton may be sold. This price includes freight, insurance, etc., and a profit ranging from 25 to 100 points, according to staple, and 5 per cent additional if it can be obtained. No transactions in excess of the fixed price by the Valuation Committee are allowed. All purchases and sales of cotton must be reported to the Control Committee, and any violation of the existing rules is punishable by fine and a possible expulsion from the association and deprivation of license. Any excess profit charged, in addition to a fine, goes to the Government. The Valuation Committee fixes the differences between grades on their own idea as to the value of each particular grade, there being no special system except their own knowledge of values and reports from our spot markets. In view of the fact that spot quotations in Liverpool are based on the quotations from the designated spot markets, it would seem desirable that every precaution possible be taken to insure their correctness.

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SUGGESTIONS AND RECOMMENDATIONS.

As stated in the report of Chairman Thompson, the Commission as a whole presents suggestions and recommendations concerning the situation as it existed at the time the observations were made. Since then the armistice has been signed and the Peace Conference has been called. The suggestions and recommendations, apart from the problems which now fall within the exclusive jurisdiction of the Peace Conference, are as follows:

The Commission, basing its opinion on such observation as it was able to make and upon such sources of information as were available, affirms the belief that crop conditions and prospects in the principal countries of the world justify the statement that for the staple food and fiber products grown in the United States, such as wheat, meat, sugar, cotton, and wool, there will prevail a strong demand, and that prices will probably continue steady and at a high level.

This belief assumes a reasonable provision for shipping facilities and a cooperative effort on the part of the Allied Governments to organize for production and distribution of staple foods, feeds, and fibers. It is also assumed that the war will end before the harvest of 1919 shall be gathered. The continuance of the war beyond that time would project problems into 1920 and 1921 that can not now be forecast or closely estimated. It is also important to bear in mind that the conditions in Russia, Roumania, Germany, and other wheat-producing countries are so unknown and so uncertain that no prediction can be made as to the influence of these countries on production and markets. One thing seems assured: All these countries involved in war will at once become increased consumers when governmental restrictions upon food are relaxed. The general situation viewed from the standpoint of the American farmer would appear for a reasonable period to be both promising and hopeful.

In the consideration of the varied crop-production problems the Commission has been impressed with the extent to which the associated governments of Great Britain and her colonies, France, Italy, and the United States have found it necessary as a war measure to formulate and put into effect fairly definite programs for the production of essential crops, especially wheat.

In the wheat-production program of the United States for 1918, and in that for 1919, it has been necessary to take into account the forecast needs of the allied countries in order to insure the food supply required for the winning of the war. From all information available it is our opinion that the disorganization of industry, including agriculture, in the principal wheat-producing countries of Europe is so great

that several years must elapse before normal production conditions are restored.

As soon as hostilities cease there will be a disposition on the part of many American farmers to resume their usual crop systems which have proved profitable, but have been abandoned or modified at a serious disadvantage in order to assist in the emergency of the wheat shortage. A large portion of these farmers will probably feel that special efforts on their part are no longer needed. It appears important, therefore, that the United States, as a matter of international good will, should take the initiative in requesting the nations now associated as belligerents with the United States to join in a program of agricultural production that shall embrace the needs of the entire world for the next few years, lest a possible serious shortage of food, feed, and fiber supplies should dissipate, if not destroy, much of the precious fruit hoped for as a result of winning the war.

The quantities of wheat and other agricultural products that will be desired from the United States will depend not only upon the usual factors, but also, and particularly, upon war-made factors which the Government of the United States can not alone appraise or estimate before the time to plant for the 1920 harvest. The uncertain factors include the resumption of wheat growing in Russia, Roumania, France, and other countries; the British policy regarding the maintenance or enlargement of their present wheat production program; the quantity and availability of supplies in distant wheat-growing areas, and the availability of sufficient tonnage.

The Commission believes that if there is likely to arise in any allied or neutral Government a need for wheat from the 1920 harvest in the United States, such Government should make a statement to the United States Government not later than May 1, 1919, as to the quantity of such wheat desired.

The Commission believes that unusual risks of overproduction should be assumed by wheat-importing nations which would be the sufferers in case of underproduction. With this principle in mind, the Commission therefore feels that it is desirable to go a step further in order to prevent, so far as practicable, an unbalanced production of wheat in the world after the crop of 1919 is harvested. We would suggest that steps be taken to have the nations now associated as belligerents with the United States determine as accurately as may be, not later than May, 1919, what will be the world's needs for wheat from the 1920 harvest, so that appropriate steps may be taken to insure an adequate supply through prompt determination and dissemination of international information regarding crop prospects and conditions, and such other steps as may be found necessary to insure adequate

production of wheat during the crucial period of post-war readjustment of industry in the affected nations. A similar arrangement might well be considered in reference to meat supplies, sugar, cotton, and wool.

The Commission further suggests that these and related subjects might be given adequate consideration if an inter-allied Agricultural Council were provided, and recommends that steps be taken for the creation of such a council, on which the member from the United States should be the Secretary of Agriculture.

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